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A GEOGRAPHY

OF

NORTH AMERICA

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THE WEST INDIES

BY

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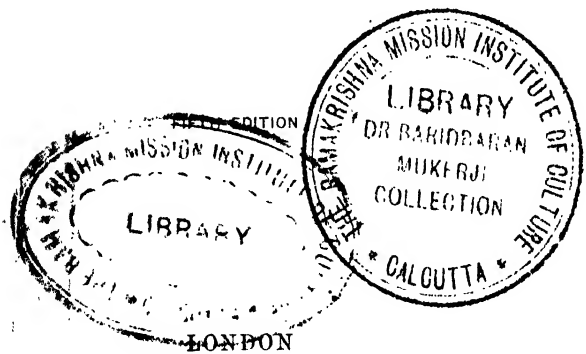
[illegible] OF ECONOMIC GEOGRAPHY IN UNIVERSITY COLLEGE, LONDON



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PREFACE

In this Series I have tried to embody the experience of a teacher and of an examiner. This experience has led me to several conclusions, which will, I believe, be confirmed by most practical teachers who are interested in Geography as a subject of real educational value:—

1. That maps in text-books cannot generally be used directly with the text, as it is impracticable to have the book open in more than one place at a time; but that their presence in the book has led to a regrettable neglect of the Atlas.
2. That an excessive variety of type and other mechanical devices for classification confuse the average pupil.
3. That most text-books contain much which would be better learned from the Atlas, or which is only an unnecessary tax on the memory.

Consequently, this Series contains no maps and little variety of type; and I have intentionally avoided mentioning, *e.g.*, exact heights, distances or sizes, small industries, and unimportant places. Wherever any definite comparisons are made, especially in Lesson 15, they are intended only for reference.

L. W. L.

CONTENTS

NOTE

At the suggestion of Mr. George Lawson, of Waid Academy, Anstruther, a large embossed map of the World (on Gall's Stereographic Cylindrical Projection) has been placed on the back cover of the volumes in this Series, to enable a class to take a pencil "rub" of any area or areas for the purpose of illustrating topics —*e.g.* of distribution—as they arise in the course of a lesson.

NORTH AMERICA

Lesson 1—Introductory

1. North America is much the most important area of the New World, owing to its size, its natural wealth, and the number and character of its inhabitants.

(1) It is more than twice as large as Europe, and nearly half as large as Asia.

(2) Its natural wealth, both vegetable and mineral, is simply enormous.

(3) It has a population of about 90,000,000, more than two-thirds of which consists of the mixed race of industrious and ingenious "White" men who inhabit the United States and Canada.

2. Like the sister continent of South America, it takes its name from Amerigo Vespucci, though he had nothing to do with its original discovery or its development.

(1) It seems to have been known to the old Greeks and Romans under the name of Atlantis, which Plato describes as an "island larger than Africa."

(2) About the year 1000 A.D. Norwegians from Iceland, under Eric the Red and his son Leif, settled in Greenland and along the New England coast, and for at least a century the settlement was so successful that tithes were even sent from time to time to the popes of Rome.

(3) For its rediscovery we owe most to Columbus,—after whom the town of Colon (Aspinwall) is called—John Cabot, and Cortez; and for its development we owe most to the French missionaries and the Puritan refugees of New England.

SURROUNDINGS

Lesson 2—General Surroundings

1. North America is surrounded by sea everywhere except in the extreme south, where there is a land boundary of a few miles across the isthmus of Panama; and this abundance of sea ought to affect its climate, its commerce, and its defence.

(1) It ought to make the climate more moist, and therefore more even, than it would otherwise be; but much will depend on the character of the sea, the direction of the prevailing winds, and the size and position of the mountains.

N.B.—Frozen sea may be regarded as land.

(2) It ought to tempt the inhabitants into various sea industries, *e.g.* fishing, such as lead on to ocean traffic.

(3) It ought to protect them from the wars and the pestilences of other continents, though it may isolate them politically.

2. The land boundary is so very small, and so much detached from the general mass of the continent, that it can be practically ignored,—even commercially, in view of the probable completion of a ship-canal across it.

(1) Nearly the whole of South America is to the east of longitude 80° W., while nearly the whole of North America is to the west of it.

(2) The rival routes for the canal were from Greytown to Brito, and from Colon to Panama. The latter has been chosen because it is much the shorter (about 45 miles); it involves a vile climate and an elevation of nearly 300 feet, but the difficulties of controlling the sudden floods on the Chagres and of making the area healthy seem to have been conquered most successfully.

(3) The Nicaragua route is four times as long, but its highest elevation is only 150 feet; it has a naturally better climate, and there are at least 120 miles of waterway already provided by Lake Nicaragua and the San Juan River.

(4) Both routes would save about 6000 miles of sea between London and San Francisco, and 9000 miles between New York and San Francisco; but neither of them has good ocean harbours, and neither of them is free from grave dangers from earthquakes—the Nicaraguan being the worse. For instance, the whole town of San Salvador has been repeatedly destroyed by earthquakes.

3. North America has more coast in proportion to its size than any other continent except Europe.

(1) For instance, it is not half the size of Asia, but it has two-thirds as much coast.

4. The cause of this is the number of large openings, especially in the north-east, which break up the coast into a succession of peninsulas — Yucatan, Florida, Nova Scotia, Labrador, Melville, Alaska, and California.

(1) Of course, the north coast is more or less useless because of the cold.

(2) The west coast is much steeper and much less indented, and has much deeper shore-water, than the east coast. It is also the warmer, as the cold Labrador current runs between the Gulf Stream and the east coast.

5. The results of it are:—

(1) The interior of the continent, at all events towards the east, is within easy reach of the commercial—if not of the climatic—advantages of the sea. For instance, wheat has been shipped direct to Liverpool from Duluth, which is a fresh-water port—like Chicago—*2000 miles from the ocean.*

(2) There are numerous harbours, some of which are very large and very safe, and this makes transport of goods

easy and cheap. From Labrador to the mouth of the Chesapeake, and from Alaska to the mouth of the Columbia, the supply of good harbours is quite extraordinary.

(3) On the Pacific coast south of the Columbia River, harbours are very few and—with the exception of San Francisco—very poor; but that part of the coast is backed—except in California—by a region of very little commercial value, where good harbours would be practically wasted.

(4) The harbours on the Atlantic coast south of the Chesapeake were not naturally very good, but they have been immensely improved by dredging and building, and the extreme fertility of the region has amply repaid the outlay.

Lesson 3—Islands

1. The islands fall into three groups — Arctic, Atlantic, and Pacific.

(1) The Arctic archipelago has much the largest total area, and includes Greenland, which is the largest island in the world, being eight or nine times as large as Great Britain.

(2) The Atlantic islands are much the most important, and are distributed in two large groups—the Canadian and the West Indian; and in two small groups—the Bermudas and the Bahamas.

2. The Arctic islands have bays admirably adapted for harbours, soil of great natural fertility, and abundance of minerals; but at present they are rendered useless for practical purposes by ice.

(1) They have been the scene of heroic efforts to discover a "north-west passage" to Asia.

(2) None of them, except Greenland, are mountainous.

N.B.—Amongst Peary's unsuccessful predecessors were Parry, who reached about 82½° N., Markham (beyond 83° N.), and Nansen (beyond 86° N.).

3. Besides the groups of islands mentioned above, the Atlantic coast is fringed throughout almost its entire length with small islands and banks—to such an extent that in many places there is practically a double coast-line.

(1) This fringe of islands is practically a line of sand-dunes caused by the Atlantic waves breaking in shallow water, and in the lagoons thus formed there is navigation for small boats almost the whole way from the mouth of the Hudson to that of the Rio Grande.

(2) Off the coast of Florida the lagoons are enclosed by coral reefs instead of sand-dunes, as the strong current of the warm Gulf Stream is extremely favourable to coral growth. Indeed, the growth has been so great as to seriously interfere with the course of the Gulf Stream itself.

(3) Off Newfoundland the sand-banks are fed by the melting of icebergs brought down by the cold Labrador current into the Gulf Stream, and the consequent precipitation—over a submarine plateau—of the soil that all icebergs carry with them from the land on which they were built up.

4. The West Indies are the summits of submarine mountains which originally connected North and South America, and they are ranged in two lines.

(1) The inner line is still high enough out of the water to look mountainous, and is largely of volcanic origin.

(2) The outer line has sunk very low, and has been brought to the surface of the water by coral formation.

5. The islands off the northern half of the Pacific coast are mainly characteristic of the fiord system, which stretches along the whole coast of British Columbia.

(1) As in Norway, they keep the in-shore water very calm, and are famous for salmon-fishing.

(2) The islands off the coast of Alaska are mainly volcanic.

Lesson 4—Inland Seas

1. The Caribbean Sea is rather larger than the Mediterranean, and played a very important part in the early days of colonisation.

(1) It is closely shut in by the curved ridge on which the West Indies stand.

(2) The barrier of the islands made the sea a natural marine fortress for the Spaniards, from which they were ejected only with great difficulty.

(3) The best passages through the barrier are the Mona, between Haiti and Puerto Rico, and the Windward, between Haiti and Cuba. Jamaica commands the latter.

2. The Gulf of Mexico is about three-quarters of the size of the Caribbean Sea, and is more distinctly landlocked.

(1) It communicates with the Caribbean Sea by the Yucatan Channel, and with the Atlantic by the Strait of Florida.

(2) There is a large area of shallow water, partly due to the encroachment of coral formation, on both sides of the entrance to the gulf, but navigation is safe and easy except during the "Nortes" gales in winter.

(3) The main importance of the gulf is that it is the reservoir for the warm water which is driven westward across the tropics by the Trade winds, and which eventually issues from the reservoir as the "Gulf" Stream.

3. Hudson Bay is about twice the size of the Black Sea, and reaches as far south as the latitude of London; but the entrance to it from the Hudson Strait is in the latitude of Reikjavik.

(1) This north end of the Hudson Strait is completely ice-bound for more than half the year, but steamers

specially built for the ice could keep up continuous traffic for at least four months in the year, including fully one month after harvest.

(2) The surrounding country is so low and level that it affords great facilities for railway construction inland to Lake Winnipeg. York Factory is already being connected thus with Winnipeg, and the line will be continued to Fort Churchill.

(3) Owing to the shape of the earth in such a high latitude, both these ports are nearer to Liverpool than Montreal is, though the latter is at least 20° farther east; and Liverpool is 1000 miles nearer to Winnipeg and 2000 miles nearer to Yokohama *via* them than *via* New York.

(4) The rivers, especially the Churchill and the Nelson, might be canalised; but at present they are too shallow even for continuous canoe traffic, owing to the excessive evaporation off the central lakes, from which they draw their waters.

(5) The bay has a very beneficial effect on the climate to the south of it.

4. The Great Lakes may be looked upon as a huge inland sea.

(1) They have a total area nearly half the size of the Mediterranean, and are all connected with one another by the St. Lawrence system and ship-canals.

(2) Lake Superior is about the size of Ireland, and Lake Huron and Lake Michigan are not very much less; Lake Ontario is about the size of Wales, and Lake Erie is half as large again.

(3) The trade on them is enormous, but they are subject to dense fogs and terrible snowstorms. Cf. p. 21.

(4) The difference between the level of Lake Superior and that of Lake Erie is only 30 feet, and there is no difference between the level of Lake Huron and that of Lake Michigan; but there is a difference of over 300 feet between Lake Erie and Lake Ontario, half of which is accounted for by Niagara.

(5) There is a complete series of canals on the Canadian side, the Welland going round Niagara; the only canal on the United States side is the Sault St. Mary, which joins Lake Huron to Lake Superior.

N.B.—The international boundary runs up the middle of all the lakes except Michigan, which is entirely in the United States.

5. As the sea is the source of all rain, these great inland seas ought to supply abundance of rain to the centre of the continent.

(1) The winds, however, do not blow regularly inland. Cf. p. 25.

(2) When the cold heavy air of winter sinks down over the Great Central Plain, the warm light air cannot penetrate inland with its burden of rain.

(3) Along the shore even of the Great Lakes, however, there is sufficient moisture to encourage a dense growth of timber, which supplies the material for the hundreds of trucks and millions of flour-barrels used in the huge grain trade of the prairies. Cf. p. 29.

SURFACE

Lesson 5—General Surface

1. The mass of North America consists of a huge plain shut in by highlands on both the east and the west.

(1) The most important feature of the western highlands is the range of the Rocky Mountains, which have a very gradual slope inland, and a steep slope to the sea.

(2) The most important feature of the eastern highlands is the range of the Appalachian Mountains, which also have a gradual slope inland and a steep one to the sea.

(3) The Appalachians are not half the length or the breadth or the height of the Rockies, but both systems run north and south—not, like the systems of the Old World, east and west.

(4) The fact that both systems run north and south, causes them to form a very marked barrier to any Trade or Anti-Trade winds blowing inland off the Atlantic or the Pacific. Cf. pp. 12, 22.

(5) The fact that both systems have a very gradual slope inland and a much steeper slope seaward, causes the rivers of the Great Central Plain to be much longer and more useful for navigation than the rivers of the coast regions.

2. The Great Central Plain is divided into two parts by a ridge which runs across it from east to west in the latitude of Lake Superior.

(1) The northern edge of this ridge is called the Height of Land; it extends on for a long way parallel to the north bank of the St. Lawrence, and the plain slopes down from it to the Arctic Ocean and Hudson Bay.

(2) The southern edge is called the Great Divide; it extends

on along the south bank of the St. Lawrence, and the plain slopes down from it to the Gulf of Mexico.

(3) At the highest point the ridge is not higher than Dartmoor or the Pentland Hills, and therefore presents little or no barrier to the passage of winds northward or southward; but it is the watershed of the Mississippi, the St. Lawrence, and the Red River.

3. In both systems of highlands there are large areas of plateau, but those in the west are much more important than those in the east.

(1) The Laurentian plateau consists mainly of the barren peninsula of Labrador, and has been "weathered" down in the course of ages to a quite insignificant height. It is probably the oldest piece of land in America.

(2) The Great Western plateau lies between the Rocky Mountains and the series of ranges that skirt the Pacific coast from the north of British Columbia to the Gulf of California.

(3) The Mexican plateau is similarly wedged in between the Rocky Mountains and the coast range of the Sierra Madre.

4. The Great Central Plain consists mainly of "plain" and "prairie," but it merges in the barren tundra of the extreme north and in the Mississippi swamps of the extreme south. Cf. p. 27.

(1) The prairies are practically the area enclosed and watered by the Saskatchewan, the Red River, the upper Mississippi, and the Missouri, *i.e.* roughly, from Edmonton and Winnipeg to St. Louis and Chicago.

(2) They are huge natural meadows on which the rainfall is too small, and fires are too frequent, for forest growth, though trees grow well on them when protected from fire.

(3) The plains lie between the prairies and the Rocky Mountains, and are higher, drier, and less fertile than the prairies.

5. Between the Appalachian Mountains and the Atlantic there is a strip of low plain which is politically very important, as it contains all the diverse interests represented by such cities as Boston, New York, and Philadelphia.

(1) It is about 900* miles long from north to south, and—except for the break marked by Long Island—it is on the average about 200 miles wide.

(2) The steepness of the Appalachians on the Atlantic side, the low level of the plain itself, and the heavy rainfall off the Gulf Stream, cause large areas of it to be very marshy.

Lesson 6—Mountains

1. There are three distinct mountain systems in North America—the Cordilleran, the Appalachian or Alleghany, and the Laurentian.

(1) The Laurentian is the only one that runs—like the mountains of the Old World—from east to west, and it was probably of great climatic importance in past ages; but it has been so much weathered away that it is now quite unimportant, being in most places no higher than the Sidlaw or the Cotswold Hills.

2. The Cordilleran system runs from Alaska to the isthmus of Panama, where—after a break of about 100 miles—it is resumed in the Andes.

(1) It consists of several parallel ranges, separated by a plateau with an average elevation of one mile above sea-level, *i.e.* higher than Ben Nevis.

(2) The width of the whole system varies from about 400 miles at each end to about 1000 miles in the centre, *i.e.* in the latitude of the Great Basin and of the great outward curve of the Pacific coast.

(3) While the greatest width is therefore in U.S.A.

territory, the highest points and the only active volcanoes are at the two ends, *e.g.* Mount Logan and Mount Elias in the north, and the Peak of Orizaba and Mount Popocatepetl in the south. Mount Logan is six times as high as Scaw Fell or Ben Lomond.

(4) The most important range in the system is that of the Rocky Mountains, which run along the eastern edge from Alaska to the Isthmus of Tehuantepec.

(5) The most important of the western or coast ranges, which form a more or less continuous series under various names, are the Sea Alps, the Cascade Mountains, the Sierra Nevada, and the Sierra Madre.

3. The Rocky Mountains proper separate the Great Central Plain from the Great Western Plateau, thus forming the main water-parting of the continent.

(1) The best-known Canadian peaks are Mount Brown and Mount Hooker, which are about three times the height of Scaw Fell or Ben Lomond; and the famous Wapta or "Kicking-Horse" Pass, which is just below Mount Hooker, is a mile above sea-level.

(2) The chief U.S.A. peaks are those of Mount Lincoln and Mount Harvard, which are more than three times the height of Ben Nevis.

(3) The Wapta Pass is the route used by the main line of Canadian Pacific Railway; but the Crow's Nest Pass —on the southern "mineral" branch line—is about 1000 feet lower than the Wapta; and the Yellowhead Pass, on the Grand Trunk Pacific, is 500 feet lower still. Even the Wapta route has a lower summit and a shorter climb than any of the U.S.A. lines.

4. The coast ranges are continuous except for the gaps by which the great plateau rivers—the Fraser, Columbia, Sacramento, San Joaquin, and Colorado—reach the sea.

(1) The great height and the direction of these ranges cause them to present a very complete barrier to west winds

off the Pacific, which would otherwise carry their precious burden of rain far inland. Thus, the "Great Basin" is partially a desert.

(2) Mounts M'Kinley, Logan, Elias, and Fairweather are in the Sea Alps, and the Peak of Orizaba and Mount Popocatepetl are in the Sierra Madre. Mount Fairweather, the smallest of the five, is five times as high as Scaw Fell or Ben Lomond.

(3) The "Great Basin" is a huge area of inland drainage shut in by a double range of mountains on each side—the Coast Range and the Sierra Nevada on the west, and the Rocky Mountains and the Wahsatch on the east; and, as all surplus water has to be got rid of by evaporation, what is left behind becomes very saline, as in the Great Salt Lake.

5. The Appalachian system consists of the three parallel ranges of the Alleghany Mountains and the detached "Catskill," "White," "Green," and "Adirondack" groups.

(1) The name "Appalachian" really belongs to the valley between the two main Alleghany ranges—the Alleghanies proper and the Blue Ridge.

(2) The highest peak, Black Dome, is about twice as high as Scaw Fell or Ben Lomond.

(3) The broken character of the system in the north-east has given great facilities for railway construction inland from the Atlantic coast. Cf. p. 15 (5).

Lesson 7—Rivers (1)

1. The Rocky Mountains form the great water-parting of the continent, but the Appalachians also have an important, though much smaller, river system.

(1) As both these watersheds are outside the tropics, they must be dependent for their regular supplies of rain and snow on south-west Anti-Trade winds; but, owing

to the great difference in height and in distance from the sea, the snow on the Appalachians will melt five or six months sooner than that on the Rockies. Cf. p. 16.

(2) Owing to the height of the coast mountains and the breadth of the Great Western Plateau, however, the south-west winds from the Pacific become so dry before they reach the Rockies that the rainfall even on the highest peaks is very small, and there are almost no glaciers.

(3) Moreover, there are no regular winds blowing inland off the Atlantic; and the Appalachians are not high enough to store the moisture that does reach them regularly from the Gulf of Mexico, in the form of glaciers at all.

2. The position and the direction of each watershed further affect the character of the rivers.

(1) Those which flow westward from the Rockies are true "plateau" rivers, flowing through deep cañons and being of very great length compared with their volume.

(2) The rivers of the Great Central Plain, on the other hand, have their beds sometimes raised by alluvium even above the level of the surrounding country; and they drain, water, and provide transport for a huge area of plain.

(3) The rivers of the Atlantic Plain, like those of the Central Plain, flow through very low and level country, and are very useful; but, like those of the Pacific slope, they are comparatively short, and vary little in volume.

3. When examined more in detail, the Appalachian rivers are seen to have special advantages and disadvantages of their own.

(1) They have a more uniform climate throughout their course than either the Central or the Pacific system.

(2) They are situated very conveniently for trade with Europe, and have important harbours at the mouths, *e.g.* New York, Philadelphia, Baltimore.

(3) They drain from forest-clad hills or reservoirs of glacial drift-sand, which guarantee a more or less uniform volume.

(4) The most important of them, *e.g.* the Hudson, Connecticut, Delaware, and Susquehanna, run practically north and south, not east and west, *i.e.* not directly inland.

(5) As this north and south drainage is rather against the general slope of the country, the rivers are often either too rapid for easy navigation, or broken by cataracts like that at Troy. This mainly accounts for the large amount of water-power in New England.

4. The rivers of the Great Central Plain also have special advantages of their own.

(1) Owing to the huge extent of plain, many of them are navigable for extraordinary distances. For instance, the Yukon is navigable for 1000 out of a total length of 1450 miles, the Mackenzie for 2000 out of 2500, the St. Lawrence for 2000 out of 2100, and the Missouri for 2600 out of 2900.

(2) Except in the extreme north-west, all of them drain more or less directly towards the European markets.

(3) The two main waterways of the St. Lawrence and the Mississippi have their head-waters within a few miles of each other, while their mouths are 3000 miles apart. So, too, the two main tributaries of the Mississippi—the Missouri and the Ohio—have their mouths near each other, while their head-waters are 2000 miles apart.

5. There are, however, several drawbacks to this Central system.

(1) The southern rivers vary greatly in volume, the usual variation of the Missouri at Jefferson being about 35 feet, that of the Arkansas at Little Rock being about 45 feet, and that of the Mississippi at Cairo or the Ohio at Louisville being about 50 feet.

(2) The northern rivers are all ice-bound for at least four months in the year.

(3) One of the longest and the most level—the Mackenzie—empties into a practically useless sea; and the Churchill and the Nelson, which are the nearest to Europe, empty into one that is partially useless. The latter are also terribly spoilt by shallows.

N.B.—The variation on the lower Mississippi is small, mainly because the Ohio and other tributaries from the low Appalachians are flooded (with the melted snow) at the end of winter, while the Missouri and other tributaries from the much higher Rockies are not flooded till the middle of summer. Cf. p. 14.

6. Owing to the small rainfall and the steep slope, the plateau rivers plough such deep cañons that they are almost useless for any purpose. Their scenery is, however, magnificent; and outside the cañons, even when they are unfit for navigation, they may still be useful—

(1) For irrigation, as in California;
(2) For mechanical power, as in British Columbia;
(3) For timber floating, as in Oregon.

Lesson 8—Rivers (2)

1. The four longest rivers of North America are the Mississippi-Missouri, which is about *twenty times* as long as the Thames; the St. Lawrence, which is just half the length of its sister river; and the Mackenzie and the Rio Grande, which are respectively rather longer and rather shorter than the St. Lawrence.

(1) The main importance of the Rio Grande, however, is only that it makes a convenient political boundary between Texas and Mexico, *i.e.* between "English" and "Latin" America.
(2) The Mackenzie drains a huge area, carrying off the surplus water of the Great Slave, Great Bear, and Athabasca lakes, but it does almost more harm than good.

(3) The reason for this is that throughout its lower course it is ice-bound for three-quarters of the year, while wheat can be ripened in its upper basin; and the melted snow from the latter, being checked by the ice in the former, floods the whole country for miles, eventually converting it into one enormous frozen marsh.

2. The four most important rivers, however, are the Mississippi, St. Lawrence, Ohio, and Hudson.

(1) The Nelson-Saskatchewan will become very important, especially with the development of traffic *via* the Hudson Bay.

3. The Mississippi has the most important basin in the New World, draining an area nearly half as large as Europe; and it is the most important basin in the whole world that is entirely in temperate latitudes.

(1) Unlike the Hoangho and the Yang-tse-kiang, it drains from north to south, not from west to east; and this gives it a much greater variety of climate, with the accompanying variation of products.

(2) It has a similar advantage over the Amazon, and also has a much healthier climate and large accessible supplies of coal and iron—*i.e.* fuel and machinery.

(3) Like the Volga, the Mississippi itself rises at a very low elevation, and therefore its pace is not great, in spite of the Missouri and its other mountain-born tributaries; the average fall from its very source on the Height of Land to the Gulf of Mexico is not more than 6 inches per mile, and south of the Falls of St. Anthony it is much less.

(4) As the river-system is entirely destitute of lakes, however, an enormous amount of alluvium is brought down to the mouth, and the tide there is not strong enough to keep the waterway clear. The mud discolours the sea for 15 or 16 miles out, but a quantity is also deposited, especially by the Arkansas tributary, in the bed of the river. This raises it above the level of the surrounding

country, so that the banks have to be protected by artificial "levées."

(5) The Arkansas, like the Missouri, rises at a height of more than 12,000 feet on the west, *i.e.* the windward, side of the Rocky Mountains proper.

4. The Missouri is to the Mississippi what the Inn is to the Danube, and what the Jumna is to the Ganges —a tributary longer than the main stream.

(1) The distance from St. Louis up to the source of the Missouri is nearly 3000 miles, while that up to the source of the Mississippi is not 1500 miles.

(2) The river can be navigated right up to the foot of the Rockies, the head of navigation above Fort Benton being about 4000 miles from the Gulf of Mexico.

(3) So much of the original volume is lost, however, by evaporation and owing to the porous character of the soil, that the Missouri contributes very little more than the Mississippi does to the joint river at St. Louis.

5. The Ohio is in some ways the most important part of the Mississippi basin, although it is only one-third the size of the Missouri.

(1) It has much the heaviest rainfall and the richest mineral wealth.

(2) It is navigable—except for the Louisville rapids, which are avoided by a canal—for its entire length, *i.e.* up the confluence of the Alleghany and the Monongahela.

(3) The Alleghany, again, is navigable from Pittsburg almost up to its source, and is connected by canal with Lake Erie and the St. Lawrence basin generally.

6. The Hudson is not nearly even half as long as the Ohio, and is frozen in winter, but it is a very important international route.

(1) It is navigable for about 150 miles—up to Albany, and its valley has given very great facilities for railway construction.

(2) It connects New York *via* the Erie lake and canal with the grain and pasture areas of the Great Central Plain, and *via* the Champlain lake and canal system with the harbour of Montreal.

(3) It is so beautiful that it is called "the American Rhine," and it supplies New York with a rich annual harvest of magnificent ice.

7. The St. Lawrence rises, like the Mississippi, at a very low elevation on the Height of Land, where it receives the first of its many names, St. Louis; and its average fall per mile for 2000 miles—deducting the 300 feet of the Niagara Falls and rapids—is practically imperceptible.

(1) The coldness of the Labrador current, the presence of so much land round the estuary, the absence of mountains to keep off the Arctic winds, the freshness of the water, and the high latitude, all combine to make it ice-bound for four months every year.

(2) Even when it is open, the navigation is not very good: two of the three entrances to the estuary, the Gut of Canso and Belle Isle Strait, are very narrow; the meeting of the Gulf Stream with the Labrador current causes dense and frequent fogs; and the need for ship-canals is obvious.

(3) But the river comes through so many lakes that its waters are too pure to deposit any bar or delta, and the importance of these lakes for commerce is literally enormous. Ocean vessels can ply for 1000 miles up the waterway—to Montreal, and lake vessels can ply for another 1000 miles—to Duluth.

N.B.—Montreal is 800 miles nearer to Liverpool than New York is.

CLIMATE

Lesson 9—Climate (1)

1. The size of North America is so great, and its surface is so varied, that there must be great variety of climate; and the three main causes which determine the climate, are heat, moisture, and wind.

(1) The moisture depends on the distance from large areas of water and the direction of the prevailing wind.
(2) The heat depends on the latitude, the slope of the land, the height, and shelter.

2. North America extends over more than 60° of latitude—from Cape Murchison to Golfo Dulce.

(1) The Boothia peninsula is in the latitude of the North Cape, and Fort Churchill in that of Stockholm.
(2) Costa Rica is in the latitude of Ceylon, and San José in that of Trichinopoli.

3. The length of the day, of course, varies, like the actual heat of the sun's rays, with the latitude. The difference between the longest and the shortest day in the year is practically imperceptible in the extreme south, while it is more than twelve hours in the extreme north.

(1) At Port Nelson or Fort Churchill there are about eighteen hours of daylight at midsummer, and at Klondyke there are about twenty hours.
(2) This long duration of sunlight leaves very little time for radiation of heat, and makes it possible to ripen even wheat as far north as the valley of the Peace river.
(3) Of course, the midwinter night is correspondingly long, but the snow helps to lessen the darkness and to keep the soil warm.

(4) The earth is so small and is moving so slowly in high latitudes that the land there passes very slowly from under the sun's rays. For instance, a degree of latitude measures only about 34 miles at Klondyke, but nearly 60 miles at New Orleans.

(5) Where there is the greatest difference in the length of the day, there are also usually the greatest extremes of summer and winter climate. The difference between the summer and the winter temperature is nearly 60° at Montreal, but only 10° at Havana.

4. This extreme contrast between the seasons is, however, one main feature of the climate over practically the entire continent.

(1) Owing to the absence of mountains across the country from east to west, there is no barrier between the Arctic cold and the Tropical heat; and this makes the summers very warm even within the Arctic circle, while the winters are very cold even as far south as the latitude of Algiers. For instance, wine can be made in Canada from grapes ripened on the spot in the open air, while orange-trees are killed by frost in Florida.

(2) This absence of mountains also causes the terrible "blizzards" of the U.S.A., and helps to make the navigation on the Great Lakes very dangerous—owing to the strong contrast between the warm water of the Mexican Gulf and the icy water of the lakes.

The air over the latter under a cloudless sky is naturally very moist; and thus warm dry winds from the south coming into this cool moist air cause dense fogs, while cold dry winds from the north cause terrible snow-storms.

5. Another important feature in the climate is this extreme contrast between the coastal regions and the interior—which is not confined to the Great Lakes and the Gulf of Mexico.

(1) As the mountains run north and south parallel to the coast, they cut off the moisture and the cool air which the Atlantic and the Pacific would otherwise send to the interior.

(2) This also accounts both for the practical absence of glaciers in the Rocky Mountains proper of the U.S.A., and for the healthiness of the climate in spite of the great extremes.

(3) Fortunately, the Gulf of Mexico is very warm, and the Anti-Trades carry warmth and moisture from it up the Mississippi valley and along the Atlantic plain.

Lesson 10—Climate (2)

1. The word Climate means "Slope," and the slope has a very great effect on what we call "climate."

(1) The heat of the sun's rays varies with the angle at which they fall upon the earth, a direct ray being warmer than an indirect one — because it is more concentrated, and because it passes through less atmosphere.

(2) A garden that lies on the southward slope of a hill in North America, *e.g.* the vineyards and peach alleys of Hamilton, Ont., is warmer than one that lies on the northward slope.

2. Height itself affects temperature very much, whatever the slope.

(1) The peaks of Orizaba and Popocatepetl are covered with perpetual snow, though cacao and banana trees can grow wild at their base.

(2) There are belts of vegetation up their sides, changing, with the height, from sugar plantations and vanilla gardens to fields of wheat and barley, from fields of wheat and barley to forests of deciduous trees, from deciduous trees to cone-bearing, and from cone-bearing trees to mountain grasses.

3. Mountain heights provide shelter for the valleys and plains below them.

(1) The Rocky Mountains shelter very greatly all the region to the west of them from the cold Arctic winds, though they also bar the passage inland of the warm Pacific winds.

(2) The orange-groves of Florida are sometimes severely injured by north winds in winter, when those of Carolina are completely sheltered by the Alleghany Mountains.

(3) Some of the hottest regions on the face of the earth are between the parallel ranges of the Great Western Plateau, *e.g.* the Death Valley and the Painted Desert.

N.B.—These regions have, however, terribly cold winters; in fact, they have the greatest extremes on the whole continent—owing to the height and to the excessive dryness of the plateau.

4. Such extremes are impossible within the influence of the ocean, for any large area of water has three great advantages.

(1) It equalises summer and winter temperature.
(2) It checks sudden changes of temperature.
(3) It supplies vapour for rain.

5. As water becomes hot and cold more slowly than land, it helps to keep land warm in winter and cool in summer.

(1) St. Louis is much hotter in summer and colder in winter than Washington, which is in the same latitude.

(2) Summer frosts are quite common and very dangerous among the wheat-fields of Manitoba; they are unknown in Vancouver Island, which is in the same latitude.

(3) San Francisco is cooler than New York in summer. Both are on the sea, and New York is the farther north; but the prevailing winds at San Francisco are "sea" winds, while at New York they are "land" winds.

6. The sea is the source of all rain, and therefore the rainfall ought to increase with nearness to the sea.

(1) The average rainfall along the west coast from about San Francisco up to Alaska, and along the east coast from about Galveston up to Labrador, is always over 40 inches; in the interior of the continent it is always under 20 inches, and sometimes under 10.

(2) The precise amount depends on the character of the winds and of the mountains or other condensing medium. For instance, at Vancouver, which is just in the centre of the Anti-Trade region, the rainfall is about 60 inches; at Winnipeg, which is in the same latitude about 1100 miles inland, it is 16. The result is that British Columbia is covered with dense timber, while Manitoba is treeless.

(3) As there are no mountains in the north-east to precipitate moisture in the form of rain, it is precipitated by the cold Arctic winds in the form of snow, and the snowfall increases with the moisture. At Winnipeg it is about 60 inches, while in the triangle shut in by the Great Lakes, the Hudson Bay, and the Gulf of St. Lawrence it rises to 160.

N.B.—10 inches of snow = 1 inch of rain.

7. The sea contains both cold and warm currents, which respectively decrease or increase the evaporation, and which have other important effects on climate.

(1) The cold Labrador current makes the north-east corner much colder, and gives it a less rainfall, than the north-west corner, which enjoys the full influence of the warm Japan Stream. For instance, Sitka has the same winter temperature as New York, which is 1200 miles farther south.

(2) The Gulf Stream makes Disko Bay, which is well within the Arctic circle, warmer in winter than the Hamilton Inlet, which is 1000 miles farther south, but chilled by the Labrador current.

(3) Where cold and warm currents meet, as off the Newfoundland Banks, there are constant fogs. Cf. the Great Lakes, p. 21.

8. The amount of moisture carried inland depends, however, on the winds—north-east Trades in the Tropics, and south-west Anti-Trades outside the Tropics.

(1) The north-east Trades deposit over 80 inches of rain every year along the Atlantic coast of Honduras and Nicaragua; but, of course, there are no regular winds blowing to the "tropical" part of the Pacific slope.

(2) The south-west Anti-Trades deposit over 60 inches along the Pacific coast of Oregon and Washington, where the mountains are so near the sea that they meet the wet winds at their wettest; but, of course, there are no regular winds blowing to the "temperate" part of the Atlantic coast.

(3) Owing to the barrier of the Sierra Nevada, there is less than 10 inches a year in the Great Basin, and for similar reasons there is less than 20 inches over the whole of the prairie.

9. This absence of moisture inland has many results.

(1) It makes the climate very healthy, but causes great extremes.

(2) It is very advantageous for flour-milling, but disadvantageous for spinning. The cotton-spinners of Lowell have to charge their mills with vapour artificially in order to compete with those of Manchester, but the millers of Minneapolis can compete even with those of Buda-Pesth.

(3) The wet side of the mountains produces timber, while the dry side produces pasture; the dry heat of the interior produces wheat, while the damp heat of the coast produces cotton. Cf. the timber of British Columbia and Oregon, the pasture of Alberta and Wyoming, the wheat of Manitoba and Minnesota, and the cotton of Georgia and Carolina.

PRODUCTIONS

Lesson 11—Vegetation (1)

1. The vegetation of North America depends on soil and climate, and it may be roughly classified under five heads:—

(1) The Arctic Region.
(2) The Cordilleran Plateau.
(3) The Central Plain.
(4) The Temperate Coast Region.
(5) The Tropical Coast Region (including the West Indies).

2. The Arctic Region consists of "tundra," and produces only dwarf vegetation—stunted trees, mosses, etc.

(1) It extends over almost a quarter of the continent.
(2) The summer is hot enough, partly owing to the low level, but it is too short to develop properly the grains and roots which civilised man and his domestic animals need.
(3) The length of the winter and the intensity of the cold cause the animals to grow additional fur; and fur is, therefore, the main commercial product of the region, the vegetation being too stunted to have any commercial value.
(4) The recent development of gold-mining along the Yukon has suggested the existence of considerable mineral wealth in all the north-west part of the region.
(5) The climate and the conditions of life make it an admirable resort for people in search of health or sport during the short, bright, warm summer.

3. Like the Arctic Region, the Cordilleran Plateau is at present practically a desert; but the cause is drought, not cold.

(1) It extends over nearly one-fifth of the continent.

(2) Its mountain barriers cut it off from both the climatic and the commercial advantages of the sea, and its dryness and its height combined give it terrible extremes of climate; but the very same causes give it pure air, constant sunshine, and convenient markets among the neighbouring mining centres of the Rockies.

(3) In most places the soil is deep, and has produced so little vegetation of any kind that it has much fertility stored in it—waiting for water.

(4) Irrigation could be provided for a considerable area by storing the rain that does fall in winter on the mountains, instead of allowing it to run to waste in the thirsty soil during the time that plants are not growing; and wherever irrigation has been tried, the desert has literally blossomed as the rose.

(5) The places where the rapid evaporation has caused the soil to be encrusted with salt, may be regarded as utterly useless.

4. The Central Plain includes all the "plains" and "prairies," *i.e.* from the Michigan peninsula to the Rockies, and from the southern limit of the Tundra to the northern limit of the Gulf lowlands. Cf. p. 10.

(1) The "plains" produce pasture, and the "prairies" produce grain, with timber round the lakes. Cf. p. 8.

(2) These "plains" are a huge tract of rolling grass lands, stretching parallel to the Rockies from Alberta to Texas; and on them the air is clear and bracing, the ground is firm and dry, the water-supply is sufficient, the grass is rich, and the price of land is very low. In fact, they form ideal pastures—for sheep on the higher, and for cattle on the lower levels.

(3) The "prairies" lie to the east of the plains, and are lower, warmer, and richer. They are practically a continuous stretch of low and level land, far enough from the sea to be dry, but with enough vegetable matter in the soil to retain moisture; they have been enriched for centuries with the ashes of prairie fires

and the bones and other refuse of beasts and birds, until their fertility is extraordinary; they have been in cultivation for very few years, especially in Canada; and they have really remarkable facilities for transport.

(4) They have two disadvantages—they are subject to summer frosts and to floods. Both are mainly due to the absence of trees to check radiation at night, and the absence of mountains to exclude the cold Arctic winds; and both can be greatly lessened by planting trees.

The frosts can also be rendered harmless in the meantime by "smudge-firing," *i.e.* burning damp straw (which is of no value in the grain districts) along the north side of the grain-fields on frosty nights.

(5) The species of grain varies with the heat and the moisture. In the north, where the dryness and the extremes of climate are the greatest, it is wheat; in the centre, where the extremes are less, and where the Mississippi valley has an exceptionally good water-supply, it is maize; and in the south, where the climate varies least, and where the surface is a swamp, it is rice.

Lesson 12—Vegetation (2)

1. The "Temperate" Coast Region extends from the St. Lawrence to the Rio Grande in the east, and from Alaska to Lower California in the west.

(1) Both divisions consist of a low coastal plain backed by mountains; but the plain is very much wider, and the mountains are much lower, in the east than in the west.

(2) Both have a more even climate, a less fertile soil, and a greater variety of crops than the Central Plain has; and the west has a rather milder climate and a rather richer soil than the east.

(3) The great distinction between the two is that, owing to the direction of the regular winds and ocean currents, the rainfall increases from north to south in the east,

but from south to north in the west. South California is a sandy desert, while Florida is a sandy swamp.

2. The Atlantic section may be roughly divided into three distinct areas:—

(1) A forest area, from Chesapeake Bay up to the Laurentian Mountains. Cf. the name *Penn-sylvania*.
(2) A fibre area, from Chesapeake Bay down to the Rio Grande—except for the intrusion of
(3) The fruit area of Florida.

3. The forest area is the sphere of the heaviest snowfall, on which the "lumber" trade largely depends.

(1) The snow is the main cause of the forest growth; it makes excellent temporary roads through the forest in winter, and when it melts in spring, it carries the "logs" down to the saw-mills. Cf. p. 8.
(2) The trees include both evergreens such as pine and spruce, and deciduous trees such as birch and maple; and the chief "lumber" States at present are Quebec, Maine, and New Brunswick.
(3) Both New England and Lower Canada owe much of their subsequent prosperity to the "lumberers," who cleared the land, made roads, and built bridges for the farmers who were destined to follow them. The cleared land was devoted to "mixed" farming.
(4) The soil is not very fertile, having been deposited by glacial action, but for that very reason it does not wear out easily under constant tillage; and the climate, being more even than farther inland, allows a greater variety of crops. For instance, the lowlands of Ontario produce cheese, while those of New York produce hops; the peninsula of Nova Scotia produces apples, while the Delaware peninsula produces peaches.

4. The fibre area commands the markets of the world for the best cotton and the best "pipe" and "cigarette" tobacco.

(1) The tobacco is grown on the higher and more northerly

part, *i.e.* the south-east corner of the Alleghany Mountains, the chief states being Kentucky and Virginia.

(2) This area was never covered with glacier; and, though the Kentucky limestone is still very fertile, the Virginian soil is growing so perceptibly poorer that Richmond has quite lost its pre-eminence in the tobacco trade—in favour of Louisville.

(3) The cotton is grown on the lower and more southerly part, from South Carolina to Texas, but is of two kinds—"sea-island" or long-staple, and "upland" or short-staple.

(4) The long-staple cotton is grown on the low islands off Georgia, South Carolina, and Florida, where the warm, damp air is so favourable to the plant that its product is the finest in the world, and is used for all the best French and Swiss muslins.

(5) The short-staple cotton is much the more abundant, growing over all the low land in the south of the Mississippi basin; but it is much the less valuable.

5. Florida is a sandy swamp enjoying such advantages in latitude and from the Gulf Stream that it is an ideal place for semi-tropical fruit. 14,743

(1) Even pine-apples grow to great perfection, but the chief crop is oranges.

6. The Pacific section of this temperate coast may also be roughly divided into three areas.

(1) From California northwards there is an area of timber and fruit, the pears being specially famous. Forests cover all the west, *i.e.* the wet, side of the Cascade Mountains; and the influence of the Japan Stream and the Anti-Trades makes the range of temperature so little that some of the trees, *e.g.* the Douglas fir, grow to an enormous height—300 feet.

(2) In the centre there is a grain and fruit area. Between the Sierra Nevada and the Coast Range there is a valley about 400 miles long and from 60 to 70 miles

wide. The northern half of it is splendidly watered by the Sacramento, and the southern half by the San Joaquin; and the dry heat is particularly favourable to the production of wheat, wine, and wool. The sheep naturally occupy the highest, and the wheat occupies the lowest land; and the vineyards cover the gentle slopes between the two.

(3) In the south there is a practically useless strip—from S. Diego southward. It comes within the influence of the Trade winds, and therefore has no regular winds bringing rain to it. The heat of the tableland itself, however, is so great that it is the cause of a south-east monsoon, which brings the only considerable supplies of rain to the Pacific coast of Central America.

7. The vegetation of the Tropical coasts and the West Indies is very varied and very prolific, both the heat and the rainfall being great. It includes—

(1) Forests of mahogany, logwood, etc.
(2) Fibres, such as tobacco, cotton, and various kinds of agave.
(3) Coffee, cacao, sugar, etc.

N.B.—See under "West Indies."

Lesson 13—Minerals

1. North America is very rich in minerals, especially in coal and iron and in the "precious metals."

(1) Coal and iron are the most important of all minerals, because they supply fuel and machinery.
(2) Gold and silver come next, because they supply the great standard of value and medium of exchange.
(3) The United States are extremely rich in all the four.

2. The mineral wealth may be classified under two heads—minerals proper and metals, and the former may be subdivided into—

(1) Various kinds of fuel, *e.g.* coal, oil, gas.
(2) All other minerals, *e.g.* china-clay, silica, salt.
(3) The fuels bear the same kind of relation to the other minerals that the precious metals do to the other metals.

3. The country is naturally divided into three great mineral fields, corresponding to the three great mountain systems.

(1) The Appalachian field, which stretches from the Gulf of St. Lawrence to Alabama, is specially rich in coal and iron.
(2) The Cordilleran field, which stretches from the Yukon to Mexico, is specially rich in gold and silver.
(3) The Laurentian field, which is thoroughly explored as yet only round Lake Superior, is specially rich in iron and copper.

4. The coal is mainly confined to the United States and Canada, but in both countries it is found near to iron, to limestone (for "flux" in smelting), and to navigable water. This greatly increases its value, and lowers its price.

(1) The States produce *forty times* as much as Canada, though their coal area is only three times as large as the Canadian.
(2) The Canadian fields are rich, well distributed, and conveniently situated; but the beds have been so much disturbed by mountain-building in past ages that they are very difficult to work.
(3) Except in the anthracite districts, the U.S.A. seams are more or less uniformly horizontal, above water level, and very thick; the total output is three times that of Germany, and considerably greater than that even of the United Kingdom.

5. The oil and gas are almost entirely confined to the United States, though a little oil is found in

Canada; and Russia, the second great exporter in the world, exports little more than half as much as the States.

(1) The U.S.A. oil comes mainly from the south shore of Lake Erie, *i.e.* the north-west of Pennsylvania, especially from Bradford, and it is carried by pipes both down to the lake and to the Atlantic.

(2) The Canadian oil comes mainly from the north shore of Lake Erie, *i.e.* the south-west of Ontario, especially from Petrolia.

(3) The gas comes mainly from Pennsylvania, especially from round Pittsburg, and is extremely useful in the iron and glass industries.

6. The iron is found in each of the three great mineral fields.

(1) The richest Laurentian deposits are in Michigan, where there is neither coal nor limestone; but this is more than compensated by the facilities for transport on the Great Lakes, Port Marquette being the chief centre.

(2) The Appalachian field extends more or less from Nova Scotia to Alabama, but the most useful deposits are along the Ohio in West Virginia and along Northumberland Strait in Nova Scotia.

(3) The Cordilleran deposits are most worked on and round Vancouver Island, where fuel and transport are very cheap, and near the Wapta and Crow's Nest Passes (cf. p. 12).

N.B.—The U.S.A. output is slightly larger than that of the United Kingdom, and twice that of Germany.

7. The Cordilleran system has hitherto almost monopolised the precious metals, and the output is so great that North America produces more gold than any other continent, and more silver than all the other continents put together.

(1) The gold is found mainly in Colorado and California, and in British Columbia and along the Yukon. The two

former are hampered by want of wood and of water, but have the better climate and the advantage of quicksilver near at hand; the two latter are hampered by climate and difficulty of access, but have abundance of wood and of water.

(2) The silver is found in very large quantities across the U.S.A. plateau from Nevada to Montana and Colorado, on the Mexican plateau, and in British Columbia.

(3) The United States produce more gold than any other country except the Transvaal, and more quicksilver than all the rest of the world, Spain coming second. The Californian mines take their name of New Almaden from the old Spanish mines at Almaden.

8. The copper is found both in the Cordilleran and in the Laurentian systems, and the output is greater than that of any other continent, Europe coming second.

(1) The Cordilleran deposits are richest in Montana and Arizona, *i.e.* the east and west slopes of the Rockies.

(2) The Laurentian are richest in Michigan and Ontario, *i.e.* the south and north shores of Lake Superior.

(3) The United States produce more copper than any other country in the world.

9. The United States also produce more lead than any other country in the world, though Spain held the pre-eminence till quite recently.

(1) The output comes mainly from Colorado, though several other Cordilleran States contribute largely. Cf. Spain.

N.B.—The amount and the variety of minerals in the United States are accounted for by the size of the country and by the very varied age and character of the mountains.

Lesson 14—Fauna

1. North America has not furnished any really valuable animal for the use of civilised man, but all

the most useful animals have been domesticated in the country with complete success.

(1) Amongst the native quadrupeds are the bison—wrongly called a buffalo—and the grizzly bear.
(2) Amongst the native birds are the turkey and the humming-bird.
(3) Amongst the native fishes are the king-crab and the tarpon

2. The most important fauna of the continent may be classified under three heads:—

(1) The fur-bearing animals of the frozen north.
(2) The food fishes of the east and west coast.
(3) The sheep and cattle of the Great Central Plain.

3. The fur-bearing animals may be subdivided into

(1) Seals from the Pribylov Islands and other parts of the Alaskan coast.
(2) Big game, such as bear and elk, which are comparatively valueless.
(3) The various small animals, such as marten, sable, silver fox, beaver, mink, skunk, which come mainly from the rough and otherwise valueless marshes to the east of the Mackenzie.

4. The fish may also be subdivided under three special heads:—

(1) Sea fish, especially cod and herring, from the great Atlantic "banks," the cod coming mainly from the Newfoundland, and the herring from the New England banks.
(2) Salmon, especially from the cold, clear rivers of Washington and British Columbia, Astoria and New Westminster being the great centres.
(3) Oysters, mainly from Chesapeake Bay, where the Susquehanna and the Potomac provide the necessary percentage of fresh water and alluvial mud, and where the Delaware peninsula protects the beds from the violence of the Atlantic.

5. The sheep and cattle are found, literally in millions, on the eastward foot plains of the Rockies from Alberta to Guatemala.

(1) The sheep come mainly from the higher or more mountainous parts, *e.g.* Montana and New Mexico.

(2) The cattle are relatively most important in Guatemala, but enormously most numerous in the United States; and almost all the Mexican cattle are sent into the States.

(3) Over almost the whole region the climate is magnificent, the grass rich, the water-supply sufficient, the price of land small, and transport convenient and very cheap.

POLITICAL DIVISIONS

Lesson 15—Political Divisions

1. British North America includes the whole area from sea to sea north of the United States except Alaska and Greenland.

(1) Alaska, which is more than four times as large as the United Kingdom, was bought by the United States from Russia in 1867. It is mainly the wild basin of the Lower Yukon, which is navigable for the whole of its U.S.A. course; and its only commercial value hitherto has come from the fur-seals that breed off its coast, though it is probably very rich in gold.

(2) The capital is Sitka, to which the Russians travelled from the west, *i.e.* against the sun; and the Americans from the east, *i.e.* with the sun. Consequently, the Russian time is ahead of the American—so much so that the Russians keep their Sunday on the Americans' Saturday.

(3) Greenland, which is more than six times as large as the United Kingdom, contains the most northerly village in the world, Upernavik. Godhavn, the capital of the northern division of the island, is well within the Arctic circle; and even Godthaab, the capital of the southern division, is not far outside it.

2. British North America comprises the Dominion of Canada, Newfoundland, with its province of Labrador, and the Bermudas.

(1) Owing to its position and its size, Canada is the most important British colony. It is the largest continuous stretch of land under one flag except Russia and China; it is larger than the United States without Alaska, and nearly as large as Europe; it constitutes nearly half

the British Empire, and is about forty times as large as the island of Great Britain.

(2) Newfoundland, with Labrador, is nearly twice as large as Great Britain; but Labrador is valueless, and Newfoundland alone is only about six times as large as Wales, *i.e.* considerably smaller than England.

(3) The Bermudas have an area about one-third that of Bute, or one-seventh that of the Isle of Wight.

3. The United States, without Alaska, is only about thirty-four times as large as Great Britain; but the "territory" of Alaska is more than six times as large as Great Britain.

(1) The largest State, Texas, is three times the size of Great Britain; while the smallest, Rhode Island, is about the size of Cheshire or Dumfries. The "district" of Columbia is, however, only half the size of Rutland, *i.e.* the size of Kinross.

4. Mexico is eight and a half times as large as Great Britain, and much the largest country of North America after Canada and the States.

(1) Of the rest, Guatemala and Honduras are just half, and Nicaragua is rather more than half, the size of Great Britain; British Honduras and Salvador are about the size of Wales, and Costa Rica is nearly three times as large as Wales.

5. The West Indies have a total area rather larger than Great Britain, of which Cuba alone constitutes nearly half.

(1) Except Haiti, the two U.S.A. "areas" of Cuba and Puerto Rico, the two French possessions of Martinique and Guadeloupe, and the Dutch possession of Curaçao —all the islands of much importance in the West Indies belong to Great Britain.

DOMINION OF CANADA

Ottawa, 45° N. (=Bordeaux).

Lesson 16—Surroundings

1. Canada has sea on three sides, and even on the fourth side there is a large area of water in the Great Lakes.

(1) Owing to the climate, the Arctic Coast is practically useless.

(2) The Atlantic Coast is the most useful at present, because it has been the longest settled, it has unique facilities for communication inland, it looks towards the European markets, and its fisheries have very great political importance; but it has great climatic disadvantages. Cf. p. 19.

(3) The Pacific Coast is really the best, and will become more and more important, especially in connection with the development of its own mineral wealth and of the manufactures of Japan.

2. The land boundary both towards Alaska and towards the United States—except for the Upper St. Lawrence and the Great Lakes—is entirely artificial, and is marked in most places only by a line of iron posts.

(1) This absence of a physical barrier is beneficial to commerce, especially by rail; but it has caused some little political trouble.

(2) It has also a very marked effect on the climate of the United States. Cf. p. 21.

3. The Canadian harbours fall naturally into three groups:—

(1) The Atlantic group, which includes both river and ocean ports.
(2) The Lake group, which will increase in importance as the various canals are deepened so as to admit larger vessels to and from the Atlantic.
(3) The Pacific group, which have a great future before them.

4. The Canadian fisheries are extremely important both commercially and politically, the chief products being cod, herring, lobster, and salmon.

(1) The market value of the fish amounts to more than £4,700,000, but that does not at all represent the importance of the industry. The cod fishery alone employs more than 50,000 men, who would form an invaluable marine reserve in times of national danger.
(2) The cod, herring, and lobster come from the east coast, where both ice and access to markets are more easily obtained. The chief centre is Lunenburg, which, like the neighbouring harbour of Halifax, is never frozen, and which is conveniently situated for the despatch of the fish to the important "Romanist" markets in the West Indies and Brazil.
(3) The salmon is mainly confined to the tidal rivers of the west coast, *e.g.* the Fraser and the Skeena, where the fiords are very sheltered. The chief centre is New Westminster.

N.B.—There is a considerable trade in white fish from the Great Lakes and Lake Winnipeg, and halibut fishing is becoming very important off the west coast, *e.g.* at Port Essington.

Lesson 17—Ports

1. The Atlantic group has three important ocean harbours and three important river harbours.

(1) The ocean harbours are Halifax, St. John, and Port Nelson ("Fort York" or "York Factory").
(2) The river harbours are Montreal, Quebec, and Charlottetown.

(3) All the river harbours are completely ice-bound for four or five months every year, and Port Nelson is even worse; but, thanks to the Gulf Stream, Halifax and St. John are never frozen.

2. Halifax, which is about the size [1] of Carlisle or Exeter, has almost all the essentials to a successful harbour.

(1) It is large and deep, with excellent anchorage and its entrance protected by M'Nab Island.
(2) It is easily accessible from the ocean by the largest vessels afloat, in any weather and at any state of the tide.
(3) It has direct communication inland, being the terminus of the Inter-Colonial Railway.
(4) It is within easy reach—by water—of the Sydney and Pictou coal-fields.
(5) The richness of the land and the denseness of the population behind it guarantee return cargoes without much delay or difficulty.
(6) It is strongly fortified, but—like Esquimalt—is now garrisoned by Canadian troops.
(7) No charge is made for dockage, and there are great facilities for repairing vessels.

3. St. John and Port Nelson are distinctly inferior to Halifax, but for very different reasons.

(1) St. John, which is exactly the same size as Halifax, is much farther from coal, and is an inferior harbour, being specially troubled by the tide. The funnel shape of the Bay of Fundy, its smooth volcanic floor, and the pressure of the Gulf Stream, cause the tide to rise higher and faster than anywhere else in the world.
(2) Port Nelson lacks almost every climatic and commercial advantage except nearness to Europe, but the latter advantage must make it become more and more important. Cf. p. 7.

[1] See Lesson 21.

4. Montreal, which is as large as West Ham, is much the most important of the river harbours, but it is handicapped by the climate. Cf. p. 19.

(1) It is on an island, at the head of navigation for large ocean steamers; and it is the eastern terminus of the St. Lawrence canal system, the southern terminus of the Ottawa canal system, and the northern terminus of the Champlain canal system.

(2) It stands at the most easterly point at which the St. Lawrence is bridged; it is the terminus of the Inter-Colonial Railway, and the junction between it and the Canadian Pacific and the Grand Trunk Railways.

(3) It is the natural outlet for Ontario, the most populous and important of all the provinces; it exports enormous quantities of grain, flour, cattle, and cheese, from or through Ontario, and timber from the Ottawa.

(4) As the great transport centre of a country rich in iron, it has developed the largest iron and steel industry in the Dominion; but it has no coal. Cf. p. 50.

5. Quebec is much more important than the little island harbour of Charlottetown (cf. p. 53), but it has entirely lost its old pre-eminence, mainly owing to the deepening of the river up to Montreal.

(1) It is just the same size as Greenock, which has been supplanted by Glasgow for a similar reason. Cf. Havre and Rouen.

(2) It is the centre of a large lumber and pasture district, and the combination of pasture with forests of hemlock spruce has given rise to one of the largest leather industries in North America.

(3) It was the scene of Cartier's welcome by the Indian chief, Donnacona, in 1534, and of the heroic deaths of Wolfe and Montcalm in 1759.

6. There are seven important lake ports, all of which are in Ontario, and three of which are on Lake

Ontario, *i.e.* within easy reach of the Pennsylvanian coal-fields.

(1) Toronto, which is about the size of Newcastle, is the centre of the densest population, and has thus become a great railway junction and the chief university of Canada. Its position on the lake gives it such a good climate—in the latitude of Mentone—and the soil is so fertile, that it is also a great agricultural centre.

(2) Hamilton, which is about the size of Oxford or Bath, has similar climatic and agricultural advantages, the soil being specially suited to fruit-growing; it is also the junction of the north and south "shore" railways, and commands the Welland Canal round Niagara.

(3) Kingston is to the east end of Lake Ontario what Hamilton is to the west end; it is the first point at which the Grand Trunk Railway touches the lake, it commands the Rideau Canal to the important political centre of Ottawa, and it is in enchanting scenery.

(4) Port Arthur and Fort William command the Winnipeg grain trade from the north-west corner of Lake Superior. Port Sarnia and Owen Sound command respectively the trade from south-west and north-west across Lake Huron.

7. The Pacific coast has three important harbours —Prince Rupert, Vancouver, and Esquimalt

(1) There are innumerable inlets which, humanly speaking, must some day be harbours of world-wide reputation.

(2) Of the mainland ports, Vancouver is better than New Westminster, Burrard Inlet being a larger, deeper, and safer harbour than the mouth of the Fraser; and Vancouver has, therefore, been made the terminus of the Canadian Pacific Railway (cf. p. 46). But it cannot, as a port, rival the Grand Trunk terminus of Prince Rupert.

(3) The island harbour of Esquimalt, the port of Victoria, is one of the great natural harbours of the world. It is within easy reach, by rail and by water, of the Comox and Nanaimo coal-fields; its sea-approach up the Juan

de Fuca Strait is wide, deep, and direct; the Olympian Mountains shelter it from the south-west gales, and help to give it a beautiful climate; it practically commands the whole coal-trade of the west coast as far as San Francisco, the salmon and gold trades of the British Columbian rivers, and the fur-trade of the Alaskan islands.

Lesson 18—Surface and Climate

1. Canada, like the United States, is naturally divided into three areas:—

(1) A high mountain system in the west.
(2) A low mountain system in the east.
(3) A huge low plain in the centre.

2. The western mountain system, besides being very high, is very long, very broad, and very near the sea; it runs from north-west to south-east, and has some deep depressions across it.

(1) Thus, it meets the wet winds at their wettest, it condenses their moisture very suddenly and very completely, and it can store the moisture in huge glaciers.
(2) A large proportion of the rainfall drains away *eastward* through the depressions across the range, thus giving Canada the most useful system of inland navigation in the world; and the glacier reservoirs guarantee the supply of water even through the driest summer.
(3) Through the same depressions the warm south-west winds—completely dried by the precipitation of their moisture—can pass on over the prairie, where, as the "Chinook winds," they have a very marked effect on the climate.
(4) Under the shelter afforded by the Rockies from the cold dry north winds, the warm wet Anti-Trades make the climate of the west very mild and encourage a magnificent forest growth.

3. Central Canada is an enormous plain of very low elevation, separating the forest region of the Atlantic seaboard from the mineral wealth of the Rockies.

(1) It slopes down very gradually from the south, *i.e.* the U.S.A. boundary, to the Frozen North, and has absolutely no protection from the Arctic winds.
(2) It has also three "steps" down from the Rockies to the centre—the Alberta step, the Assiniboine, and the Manitoban,—the temperature varying with the level and the distance from the mountains.
(3) The soil is rich almost everywhere except in the Frozen North (cf. p. 26), the level affords every facility for cultivation and transport, and the climate is very healthy for man and beast, the intense frost being also very useful for cleansing and pulverising the soil.

4. The low mountain system in the east is the water-parting between the Hudson Bay and the St. Lawrence, and its position gives it a very heavy snowfall.

(1) This makes it a great forest region. Cf. p. 29.
(2) The cleared land is most suited to pasture.
(3) The narrowness of the area from north to south, compared with its length, makes the St. Lawrence valley very important for both land and water transport.

5. The chief rivers are the St. Lawrence, Saskatchewan, Mackenzie, and Fraser. Cf. Lesson 8.

(1) The St. Lawrence enters Lake Superior as the St. Louis, and leaves it as the Sault St. Mary; it leaves Lake Huron as the St. Clair, and enters Lake Erie as the Detroit; and it leaves Lake Erie and enters Lake Ontario as the Niagara. Cf. p. 19.
(2) The Mackenzie, like the great Siberian rivers, flows from a warmer into a colder climate, which is fatal to its commercial prosperity.

(3) The Fraser descends so precipitately from the Rockies that it is practically useless for navigation, though it can be navigated by moderate-sized vessels for 100 miles—up to the Yale rapids; but it teems with fish, its lower valley has been very useful in connection with the construction of the Canadian Pacific Railway, and its pace and volume will make it of great value for mechanical purposes.

6. The general level of the country and the depressions across the Rockies are most favourable to transport both by river and by rail.

(1) Montreal is the centre of a network of railways in the populous east.

(2) Winnipeg is the "pivot" of the great Canadian Pacific[1] Railway system, which is one of the most important railways, both politically and commercially, on the face of the earth.

(3) It gives uninterrupted communication for trade or troops on British territory from the Atlantic to the Pacific, and is much the shortest route to Australasia, China, and Japan; it has rich coal-fields and magnificent harbours at each end; in time of war, *e.g.* with France or Russia, it would be a much safer route to India than the Suez route, and much shorter than the Cape route.

Lesson 19—Vegetation

1. The vegetation varies, of course, with the soil and the climate; but the four great commercial products are timber, pasture, grain, and fruit.

2. Timber is the most important of all the Canadian exports, and comes from the rainy west and from the snowy east.

(1) The eastern region extends from Lake Superior to Hudson Bay, and from Lake Winnipeg to the east of New Brunswick.

[1] The *Grand Trunk Pacific* will be nearly as important.

(2) The western region is practically the islands and coastal district of British Columbia.

(3) The "lumber" trade owed its development to the fact that the supplies of timber from the Baltic to Great Britain were cut off during the Napoleonic wars.

3. The largest export is from New Brunswick Quebec, and Vancouver Island.

(1) Forests cover the north and north-east of New Brunswick, especially the basin of the Restigouche. The species of trees include spruce, cedar, and maple, the latter giving sugar as well as beautiful wood.

(2) The combination of hemlock-spruce forests and pasture round Fredericton has given rise to a large leather industry; and half the capital of the whole province is said to be invested in saw-mills at St. John.

(3) Forests also cover almost the whole of Quebec from the Ottawa to the Saguenay, and the rivers are extremely useful both for floating the "logs" and for driving the saw-mills. The species include red and white pine, spruce, and birch. The Ottawa brings down the pine, mainly from Lake Temiscaming, while the Saguenay brings down the birch, mainly from Lake St. John.

(4) The combination of hemlock-spruce and pasture has given the city of Quebec a very large leather trade; and Ottawa has the largest saw-mills in North America, the mill-hands going up country "log-cutting" when the river is frozen.

(5) The western forests consist mainly of fir, cypress, and cedar. The Vancouver Island forests are the most productive and the most conveniently situated for export, but the great saw-mill centre is on the mainland at Vancouver.

4. Next to lumber in value stand the various pastoral products, including cattle, cheese, and hay; and they come mainly from the maritime provinces and from the eastern slopes of the Rockies.

(1) Of the maritime provinces, Nova Scotia has the mildest

climate and most facilities for export; Prince Edward Island produces very good grass, partly owing to the valuable deposits of "mussel-mud" manure found off the shore; New Brunswick has dyked lands along the Bay of Fundy, which produce rich crops of grass under the natural manure of the sea-floods.

(2) Ontario, which in climate is really a "maritime" province, is the largest exporter of cheese in the world; its soil is splendidly watered, and carries heavy crops of roots, and the climate is eminently suited to cheese-making.

(3) In Alberta the number of streams, the slope of the land, and the climate are all extremely favourable to cattle-pasturing, especially round Calgary. In the east of Canada the snowfall necessitates the housing and artificial feeding of the cattle in winter; but the Chinook winds greatly modify the climate of Alberta, and the district is too dry to have a heavy snowfall.

(4) The dryness converts some of the natural grasses, *e.g.* the "Buffalo" and the "Bunch" grasses, into hay while they still remain uncut. Consequently, the cattle can generally feed over the ordinary pastures in winter, thus getting exercise in the fresh air and requiring little or no housing or house-feeding.

¶5. The grain is mainly wheat, oats, and barley.

(1) The wheat comes from the magnificent prairies west of Winnipeg, especially from Assiniboia and Manitoba, the richest returns being gathered in the Qu'Appelle and the Red River valleys.

(2) The barley comes almost entirely from Ontario, and used to go across the Great Lakes to Philadelphia for the extensive brewing industry; but it is now fed to stock, the U.S.A. tariff has killed the export. Cf. p. 63.

(3) Oats are grown, especially in Ontario and Prince Edward Island, where, like the hay, they are very useful in the breeding of horses for the United States.

¶6. The great fruit areas are Nova Scotia, Ontario, and British Columbia.

(1) Nova Scotia produces the finest apples in the world. The centre of the industry is Minas Basin, where the forest-clad hills keep off the fogs and storms from the north-east; the late spring prevents excessive making of wood, and the short autumn prevents waste of sap, while the hard winter kills the usual parasites; the dry climate is very favourable to the fruit both before and after picking; land is cheap, and markets are near —in the great cities of the eastern States.

(2) The Hamilton "peninsula" of Ontario produces very fine peaches and grapes, as well as apples; the low level, the almost "marine" climate, the latitude (that of Marseilles), and the friable shale of the soil are all exceptionally favourable.

(3) British Columbia produces pears that rival even those of California. The soil round New Westminster is exceedingly fertile, and the climate is so fine that even oranges will ripen in the open air; but the special product is pears, and the salmon-tinning industry provides all the necessaries for a tinned-fruit industry.

Cf. the oyster-tinning industry of Chesapeake Bay in connection with the tinned-vegetable industry of Maryland.

Lesson 20—Minerals

1. Canada is rich in mineral wealth, but at present the various minerals are scarcely worked at all except where there are special facilities for commerce.

(1) This is most true of coal and iron, and least true of gold.

2. There are three great coal areas—in Nova Scotia, British Columbia, and the North-West Territories.

(1) The Nova Scotia coal is found both on the mainland and on Cape Breton Island, and in both places it is on or very close to navigable water. The island field is round Sydney, and is the nearest to Europe. The peninsula field is along Northumberland Strait, between Pictou and Springhill, and is the nearest to the Atlantic

terminus of the trans-continental railway system; it is also side by side with pure limestone and very fine iron ore at New Glasgow, Truro, and Londonderry.

(2) The British Columbia coal is also found both on the mainland and on islands, but only the island fields are on navigable water; the mainland centre is Kamloops. The Vancouver Island centres of Comox and Nanaimo are nearest to the Pacific terminus of the trans-continental railway, but the Queen Charlotte Islands have the best coal.

The facilities for shipping the coal at Comox and Nanaimo are really magnificent, and the coal-field is just opposite a mountain of magnetic iron ore in the island of Texada.

(3) The coal in the North-West Territories is generally of poor quality, but of enormous extent; much the best quality is found round Calgary, especially at Lethbridge, Banff, and Cochrane, *i.e.* just where the C.P.R. begins to climb the Rockies.

3. The only important iron-works hitherto have been at New Glasgow, Truro, and Londonderry, where there are the greatest facilities for smelting and for transport, and at Montreal; but there are large deposits of ore in Ontario, Quebec, and British Columbia. Cf. p. 42.

(1) The Ontario product is now being manufactured most successfully at Hamilton, where coal can be easily imported across Lake Ontario.

N.B.—There are also valuable oil-wells in the neighbourhood, especially between Petrolia and London.

4. The precious metals are mainly confined to the Cordilleran area, though gold is worked along the south coast of Nova Scotia, and both gold and silver are worked in Ontario along the north shore of Lake Superior—the silver specially at Cobalt.

(1) Most of the Cordilleran gold is found along the Fraser, Columbia, and Yukon rivers; and the abundance of

water and timber gives the British Columbian miners a great advantage over their rivals in almost every other part of the world, especially in West Australia.

(2) The chief centres are the Cariboo district of the Fraser basin, the Kootenay district of the Columbia basin—where there are also rich silver mines,—and the Klondyke district of the Yukon basin. Rossland is the great Columbian centre.

(3) In summer the Klondyke fields can be reached by river steamer from St. Michael's, which is on the north mouth of the Yukon; but in winter there is no communication at all, and even in spring and autumn the passes across the Rockies from Juneau are difficult and dangerous. Cf. p. 54.

5. Besides the deposits of gold, silver, and oil, Ontario also contains rich deposits of copper and nickel.

(1) The copper is found in Algoma, along the north shore of Lake Huron, and the branch line of the C.P.R. from Sudbury to Sault St. Mary runs through the district.

(2) The nickel lies also along the same line of rail; the deposit is the richest in the world, and is of immense importance to a naval power like Great Britain.

6. Amongst the other minerals of Canada are gypsum and apatite—two compounds of lime which are valuable as manures—and asbestos.

(1) The gypsum is exported chiefly from Windsor (N.S.), but there are also rich deposits along the Tobique River (N.B.) and on the "isthmus" between Lake Ontario and Lake Huron.

(2) The apatite is exported chiefly from the Hull district of the Ottawa basin, but the deposit runs on westward into Ontario as far as Perth and Kingston.

(3) The asbestos, which was discovered accidentally during a forest fire, is in Quebec.

Lesson 21—Towns

1. Canada has only two towns with a population of over 100,000—Montreal and Toronto, but in a new

country the importance of a place cannot be at all gauged by its population.

(1) Montreal, the largest, is about the size of West Ham (267,000). Cf. p. 42.

(2) Toronto, the second, is about the size of Newcastle (208,000). Cf. p. 43.

(3) Quebec, which comes third, is no larger than Greenock or York, *i.e.* only one-third the size of Toronto. Cf. p. 42.

2. Five towns have a population of from 40,000 to 55,000.

(1) Hamilton, the largest of the five 13 years ago, is about the size of Barrow. Cf. p. 43.

(2) Ottawa, the largest now, is the size of Warrington or Hanley; it owes its importance mainly to its lumber trade (cf. p. 47), but partly to its being the political capital of the Dominion.

(3) Winnipeg, which is the size of Crewe or Londonderry, has risen to very great importance in a very few years, owing to transport. It stands at the confluence of two navigable rivers, and at the junction of the C.P.R. main line with at least eight other lines, including two U.S.A. lines down the Red River valley.

It is the meeting-point of east and west, forest and prairie; it commands the fur trade from the north and the grain trade from the south; in summer it has navigation up the Red River right into the United States, up the Assiniboine for more than 300 miles, and up the Saskatchewan to Edmonton,—a distance, including Lake Winnipeg, of 1500 miles.

(4) Halifax and St. John are about the size of Carlisle or Enfield. Cf. p. 41.

3. Three other towns have more than 20,000 inhabitants—London, Vancouver, and Victoria.

(1) London, the largest of the three, is the size of Scarborough or Wakefield. It stands in the very centre of the fertile Ontario "peninsula," where it enjoys a beautiful semi-marine climate which is very favourable to fruit; it is

within easy reach of navigable water on three sides—at the junction of the two branches of the Thames River, and commanding the two great through-routes by rail from Toronto to Chicago.

It is, therefore, a rising industrial and agricultural centre, its special industry being the refining of oil.

(2) Victoria, which owes its importance mainly to its magnificent harbour, is as large as Stafford or Taunton. Cf. p. 43.

4. Several other towns have between 10,000 and 20,000 inhabitants, of which Kingston, Charlottetown, and Edmonton are the most important.

(1) Kingston is about the size of Margate or Waterford. A fine climate, fertile soil, and the new transcontinental railways are making Edmonton a very important centre.

(2) Charlottetown, which is no larger than Kilkenny or Chelmsford, has a good harbour on the most sheltered coast of Prince Edward Island, looking towards the most densely peopled part of Nova Scotia; and it is the natural centre for the railway system of the island.

(3) Guelph and Brantford are twin agricultural towns in the fertile Ontaria "peninsula," and they are about the size of Warwick or Forfar; Hull is a mining and lumber centre of the same size on the banks of the Ottawa.

5. There are several smaller places, especially on the coast and in the mineral districts, which must eventually become very important, *e.g.* Fredericton, Regina, Rossland (p. 51), Calgary, and Dawson.

(1) Fredericton stands at the head of navigation for large steamers, which is also the lowest point at which the St. John is bridged; it is the size of Selkirk or Killarney (5500) and is the political capital of New Brunswick. The district round is divided between pasture and hemlock-spruce forests, and this has given rise to a leather trade. Cf. p. 47.

(2) Regina is an important station on the C.P.R., but is a tiny place like Wigtown or Oakham; it is the meeting-

point of the cattle-ranches of the "plains" and the grain-fields of the "prairies." Cf. Brandon.

(3) Calgary is a mere village, and owes its importance to its position between the Alberta pastures and the valuable coal of the Bow valley,—by which the C.P.R. climbs the Rockies. Cf. Saskatoon—the capital of the central prairies on the G.T.P. route, and for that reason selected as the seat of the University of Saskatchewan.

(4) Dawson City is the centre of the Klondyke goldfields, and stands at the confluence of the Klondyke and Yukon. It can be reached in three days by river-steamer from Lake Bennett (June to September); but there is a difference of opinion about the route to Lake Bennett, the best being probably that by the Lynn Canal *via* Skagway (U.S.A.), and the short White Pass railway. The "all-Canadian" route, by the Stickeen river *via* Telegraph Creek and the wagon-road to Lake Teslin, avoids the U.S.A. "customs."

N.B.—The sea journey from Victoria to Dyea *via* Juneau and the Lynn Canal is 100 miles longer than that to Telegraph Creek *via* Fort Wrangle and the Stickeen River.

(5) A fine climate, fertile soil, and the new transcontinental railways are making Edmonton an important centre.

6. The total population of Canada is about 5,300,000, including about 1,300,000 persons of French descent and 120,000 Red men.

(1) Of this total, Ontario, which is seven times the size of Ireland, contains considerably over 2,000,000.

(2) Quebec, which is about the same size as Ontario, contains 1,500,000—mostly French.

(3) British Columbia, which is much the largest province—being nearly twice the size of Ontario—contained in 1891 less than 100,000. In 1901 the number had been doubled.

NEWFOUNDLAND

St. John's, about 47° N. (=Nantes).

Lesson 22

1. The colony of Newfoundland includes the island itself and the dreary coast of Labrador from the west end of Belle Isle Strait to Cape Chudleigh on Hudson Strait.

(1) The colony has persistently refused to join the Dominion of Canada, and has treated the Canadian fishermen very badly It has also involved the British Government in serious political difficulties by its attitude to the French fishermen, who, by the Treaty of Utrecht, had certain exclusive fishing rights—now waived—off the coast.

2. The island has about 2000 miles of coast; and the two coasts that are exposed to the Atlantic waves and gales, are extremely broken.

(1) Where these two coasts meet, the peninsula of Avalon has been almost severed from the mainland by the deep indentations of Placentia Bay and Trinity Bay—the latter being the great terminus of the Atlantic cables.

(2) The coast-line is very rugged and fringed with islands, two of which — Miquelon and St. Pierre — unfortunately belong to France; and the French claim exclusive shore rights from Cape Ray to Cape Bonavista, *via* Belle Isle Strait—a distance of 450 miles on the most sheltered part of the coast.

(3) Many of the bays would make fine harbours in summer, but the only harbour of any importance at present is St. John's.

3. The value of the coast for fishing is very great, both round the island and along the 750 miles of Labrador that belong to Newfoundland.

(1) One-third of the whole population (about 220,000) is engaged in the fishing industry, and the export of fish products is a dozen times as valuable as that of all the other products of the colony.

(2) Of course, the cod fishery is much the most important. It is so largely confined to the Great Bank that the fishermen are known locally as "Bankers." The season lasts from June to the middle of November, and even the procuring of bait is so important that it has become a definite industry.

N.B.—The "Bait Laws" were often used most effectively against the French "Bankers."

(3) The seal fishery comes next in importance, but is carried on solely for oil and skins, the seals not being of the fur-bearing kind; the season is from the middle of November to June, and the hunting grounds are the ice-floes along the coast of Labrador.

4. Amongst the other fish products are lobsters, herring, and salmon.

(1) Lobster-canning, which is an important industry, was another cause of difficulty with the French.

(2) The herring are most plentiful in Fortune Bay, and the salmon off the Gulf coast.

5. St. John's is the only harbour of any importance at present, and is both the political and the commercial capital of the colony.

(1) It is so deep that the largest vessels can enter at any state of the tide, but the entrance is so narrow that only one vessel can enter at a time.

(2) It is less than 1700 miles from Ireland, and the peninsula of Avalon has the best climate in the colony.

(3) It is the headquarters both of the cod fishery and of the seal hunting, and has thus a population as large as that of Perth or Peterborough (31,000).

6. The climate of the colony is very unpleasant, but not unhealthy.

(1) Owing to the presence of sea on every side, the extremes

even in the portion of the country farthest from the influence of the Gulf Stream, are not nearly so great as in Canada. For instance, the thermometer seldom falls below zero.

(2) The meeting of the cold Labrador current with the warm Gulf Stream causes constant fogs.

(3) The south-west Anti-Trades bring a heavy burden of rain off the Gulf Stream; but, as the chief range of mountains, —the Long Range,—is in the extreme west, and does not present a full face to the south-west winds, the rainfall is less than it would otherwise be.

7. The surface of Newfoundland is rough and hilly, the hills rising to the height of Scaw Fell or Ben Lomond.

(1) The area is nearly as large as that of England without Wales, but a considerable portion is still unexplored; and, except on the Avalon peninsula, there is practically no settlement more than a mile or two from the coast.

(2) With such a surface and such a climate, agriculture is impossible except in a few favoured places round the coast and along the lower valleys of the rivers; indeed, fully one-third of the entire surface is covered with lakes and marshes.

(3) Consequently, the population is extremely limited, being no more than that of the single town of Hull; and the only place except St. John's that is more than a village, is Harbour Grace, a little town about the size of Monmouth or Killarney (5500).

(4) A few thousand men are, however, employed in various mining industries. Copper is worked round Placentia Bay, and there are deposits of it also round Notre Dame Bay and of coal round St. George's Bay; but both the latter are on the "French shore," where the Newfoundlanders cannot go.

(5) The only other industry of any importance is lumbering. Timber, mainly pine, is found along most of the rivers, *e.g.* the Exploits and the Humber; and the amount of water-power is favourable to the development of the industry. Unfortunately, however, some

of the best timber, like some of the best agricultural land, is found along the disputed western coast; and access to it from the land side was practically impossible.

N.B.—Quite recently a railway has been constructed right across the island, and this will probably give a great impetus to the various land industries, *e.g.* coal-mining near Grand Lake and the working of wood-pulp, etc.

THE BERMUDAS

Lesson 23

1. This group of islands is of coral formation; and, thanks to the Gulf Stream, it is in a higher latitude than any other similar group in the world.

(1) The coral formation is so porous, and the islands are so small, that there are no fresh-water springs; and, therefore, the water supply for drinking purposes depends on rain.

(2) The Gulf Stream gives the islands a wonderful climate; the variation of temperature is very slight from winter to summer, and frost is unknown.

(3) There are about 360 islands altogether, but only about 20 are inhabited; and the population of them is only 16,000, mainly negroes.

2. The importance of the group is threefold:—

(1) Their climate makes them a favourite winter resort for the Americans.

(2) It also makes them in spring the "market-garden of New York."

(3) Their position and their good harbours make them an important naval centre.

3. The two chief harbours are St. George and Hamilton.

(1) St. George, the great naval station, has the advantage of being just inside the "Narrows," which is the best passage through the coral reef.

(2) Hamilton, which is on the largest island, is the political and commercial capital, and is defended from the west by another naval station on Ireland Isle.

4. The chief products are vegetables, but fruit and timber are also important.

(1) Arrowroot, formerly the staple product, is now quite unimportant.

(2) Its place has been taken by onions, potatoes, and tomatoes.

(3) The most important fruits are melons and bananas, and the most important wood is the red "cedar," — for pencils.

UNITED STATES

Washington, about 39° N. (=Lisbon).

Lesson 24—General Surroundings

1. The country has a large area of water on every side, and the entire boundary on the east and the west is open ocean.

(1) Commercially, the Atlantic coast is at present the most important, owing to its natural facilities for foreign trade; but for home trade the Lake coast is even more important. Cf. p. 39.

(2) Climatically, the Gulf coast is the most important, as it supplies rain to half the country.

2. The Atlantic coast has five great advantages:—

(1) It is twice as long as any other, which it owes mainly to its deep indentations; it is most broken north of Cape Cod, but the most useful openings are between Cape Cod and Cape Hatteras.

(2) It is the nearest to Europe.

(3) It has very good communication inland, up the Hudson Valley and across the detached part of the Alleghany Mountains. Cf. p. 13.

(4) It has rich deposits of coal and iron just behind its best natural harbours.

(5) These harbours are free from ice the whole year round.

3. The Lake and the Gulf coasts are the same size, which is exactly half that of the Atlantic coast.

(1) Besides its importance for home trade, the Lake coast has abundance of timber and of minerals, including coal and iron; but it is ice-bound in winter.

(2) The Gulf coast is low and sandy, and has no mineral wealth of its own; but the natural slope of the

Mississippi basin brings it an immense amount of trade both by river and by rail, the fertility of the region amply repays outlay on artificial harbours, and ice is unknown.

4. The Pacific coast is only one-third the size of the Atlantic.

(1) This is mainly due to its simple, unbroken outline.
(2) It has the most genial climate of the four.
(3) It is backed for a considerable distance by desert.

5. The harbours fall naturally, therefore, into three groups.

(1) The Atlantic group, which includes the Gulf of Mexico.
(2) The Inland group, which includes both the lake harbours and river harbours, such as St. Louis and Cairo.
(3) The Pacific group.

6. The land boundary both towards Canada and towards Mexico is partly natural and partly artificial.

(1) The artificial boundary towards Canada is mainly the 49th degree of north latitude.
(2) The natural boundary towards Mexico is the Rio Grande. Cf. p. 16.
(3) The absence of natural boundaries has important political, climatic, and commercial effects. Cf. p. 39.

Lesson 25—Ports (1)

1. The Atlantic ports may be classified under two heads—the "general" ports of the northern half, and the "cotton" ports of the southern half.

(1) The former include New York, Boston, Philadelphia, Baltimore, Norfolk, and Portland.
(2) The latter include New Orleans, Savannah, Charleston, Galveston, and Mobile.
(3) The distinction is not exclusive; for instance, New York exports cotton, and New Orleans exports general products.

2. New York is the most important harbour in the New World.

(1) It stands on Manhattan Island, with the Hudson River on the west and the so-called "East River" arm of Long Island Sound on the east; and Long Island itself protects the approach from the ocean.

(2) It is practically free from ice, conveniently situated for European trade, and within easy reach of fuel and machinery.

(3) It has splendid communication inland, mainly *via* the Hudson river and canal system. Indeed, the facilities for transport by rail and by water up the Hudson and the Mohawk valleys have attracted to New York a large proportion of the export trade even from the Far West. Cf. p. 13.

(4) It is about equal to London in the matter of tonnage entering and clearing, and transacts nearly half the foreign trade of the country.

(5) The population of the old city is 1,500,000, *i.e.* twice that of Glasgow; but, as its insular position has prevented its natural expansion, it has spread a total population of 3,500,000 over its immediate neighbourhood, including the suburbs of Brooklyn, Long Island City, and Jersey City. Consequently its great local industry is clothing.

N.B.—Brooklyn is now formally incorporated in New York.

3. Boston, the mother city of New England and the most "English" of all the U.S.A. cities, is rather larger than Birmingham.

(1) It occupies a group of peninsulas on the tidal estuary of the Charles River, and has a perfectly safe and commodious harbour; but it is some distance from coal and iron.

(2) It inherits very famous literary and educational traditions, which have made it the great intellectual centre of the country; and it played a prominent part in the War of Independence.

(3) The great water-power and the vast forests of New England have led to a wide development of textile, leather, and paper industries, though the climate is not altogether suitable for textiles (cf. p. 25); and Boston imports large quantities of cotton, wool, and hides, for distribution to river-side towns like Lowell, Lawrence, and Haverhill, and collects their manufactures for export.

(4) It has also developed large clothing and book industries of its own; and its neighbour, Lynn, has developed a large boot and shoe industry.

N.B.—Of course, paper is even more important than leather in the book trade; and Holyoke, which stands on the Connecticut at the foot of the forest-clad Hoosac Mountains, makes more paper than any other town in America.

(5) As the chief harbour on the New England coast, Boston has attracted all the great western railways; and thus it has special facilities for distributing goods, *e.g.* the fish of Gloucester, the largest fishing-port in the country.

4. Philadelphia is about twice the size of Liverpool, with which it has a good deal in common.

(1) It stands at the confluence of the Delaware and the Schuylkill, which is also the head of ocean navigation; but the amount of land round the estuary, and the exposure to the northern winds, sometimes cause it to be partially frozen in winter.

(2) Its importance is due, therefore, less to its harbour than to the field of magnificent anthracite coal which lies along the Schuylkill, and which has made the city the greatest manufacturing and brewing centre in the New World. Cf. p. 48.

(3) It has very good communication inland up the valley of the Susquehanna, which in its lower course breaks right across the Alleghanies; and this makes it the natural outlet eastward for the great coal, iron, and oil fields of Pennsylvania.

(4) Pennsylvania is one of the best sheep-raising districts in the country, and has large forests of hemlock-spruce in the north; and Philadelphia is also the natural

outlet for the wool, skins, and tanning bark. This gave rise to the carpet and leather industries for which the city is now so famous.

(5) The fine sheltered harbour, the abundance of coal and iron, and the nearness of good timber, have also made it the greatest shipbuilding centre in the country.

N.B.—It was the most southerly port in the Anti-Slave States.

5. Baltimore and Norfolk stand at opposite ends of Chesapeake Bay, to the west of which the soil and the climate are admirably suited to fruit and fibre, especially tobacco, and in which there are some of the finest oyster-beds in the world.

(1) Baltimore, which is nearly as large as Boston, is the centre of the tinned fruit, vegetable, and oyster industries, and manufactures tobacco.

(2) Norfolk, which is only a little town the size of Colchester or Londonderry, stands at the mouth of the James River; it is one of the finest natural harbours on the Atlantic coast, and commands part of the tobacco trade of the James and the Roanoke valleys.

6. Portland, the commercial capital of the "Pine Tree State" of Maine, is just the same size as Norfolk, but it has a very different trade.

(1) It has such a fine harbour, and is so free from ice, that it is the natural winter port for the St. Lawrence; and thus it has been made the terminus of the Grand Trunk Railway of Canada.

(2) Maine has a huge lumber trade; and, as the trees are mainly conifers, especially spruce, and as the water is very soft and pure, there are exceptional facilities for pulp and paper works.

(3) Portland is the nearest of the U.S.A. harbours to Europe, and has just behind it—on the Androscoggin River—the best water-power in the State for these works. It has also a leather industry.

N.B.—The Androscoggin also drives the cotton mills of Lewiston.

7. Of the five "cotton" ports, New Orleans is much the largest, being nearly the size of Bristol.

(1) Like Bristol, it is really a river port, and the approach has been made possible for ocean vessels only after very expensive dredging.

(2) It is the most central port on the Gulf coast, and is, like Bristol, a very old town; it has, therefore, come to control a number of trades besides the cotton, especially the sugar and rice of Louisiana.

(3) It is, however, a long way from coal and iron, and its low level and swampy surroundings make it very unhealthy.

8. Of the other "cotton" ports, the two on the Gulf have the best natural harbours, but the two on the Atlantic are the most important.

(1) Charleston, which has now a population of nearly 60,000, stands at the confluence of the Ashley and the Cooper rivers, where the volume of water made it possible to construct a good artificial harbour seven miles from the ocean, in the very centre of the South Carolina coast.

The water-power from the "Piedmont" slopes behind it is very great, and very useful both to lumbering and to cotton manufacture; the climate is suitable to the raising of early fruits and vegetables, and there are rich deposits of phosphates along the Ashley.

Its special export, however,—in which the neighbouring harbour of Wilmington shares—is of rosin and turpentine from the yellow pine forests of the Carolina coastal plain. It also exports excellent rice.

(2) Savannah, which in 1903 was a little larger than Charleston, stands on the tidal estuary of the Savannah, protected from the Atlantic by a line of flat "sea-islands," which produce the best cotton in the world; and the falls of the Savannah have made the inland centre of Augusta the chief manufacturing city of the southern States. Savannah also exports "Carolina" rice.

(3) Mobile, which is the size of Perth or Peterborough, stands on the fine estuary of the Alabama; and thus it has navigation right through the lumber district of south Alabama very nearly up to the Birmingham coal and iron field, as well as direct communication by rail with both the centre and the south of Mississippi, a great cotton-growing State.

(4) Galveston, which is the same size as Mobile, is the only good harbour in Texas, the largest State in the Union; it is the natural port for the great railway centre of Dallas; it collects excellent cotton from along the coast, and has access by the Southern Pacific Railway to the finest cattle ranches of the Far West. As both a cotton and a cattle centre, it has special advantages for manufacturing oil-cake.

Lesson 26—Ports (2)

1. The Inland ports are numerous and extremely important, and almost all of them are on the Great Lakes.

(1) By far the most important are Chicago, St. Louis, and Buffalo.

(2) Five others have, however, a large trade—Cleveland, Detroit, Milwaukee, Toledo, and Duluth.

2. Chicago is one of the most extraordinary cities in the world. In 1830 it was a hamlet of 70 souls living in 12 cottages; when it had grown to more than 25,000 houses, it was burnt to the ground —in 1871; and to-day it is a huge metropolis three times as large as Manchester, and covering an area as large as the whole county of Renfrew. In sixty years it multiplied itself 20,000 times!

(1) It is one of the most perfectly-equipped ports in the world, and has been deepened to admit vessels carrying up to 5000 tons of cargo. More vessels enter and

clear every year than at London and New York combined!

(2) By the Illinois river and canal system it has direct water communication with St. Louis, *i.e.* with the Gulf of Mexico, through the richest maize area of the country.

N.B.—Maize is specially used in fattening pigs—U.S.A. "hogs."

(3) All the trans-continental railways of the north must converge on it to get round Lake Michigan, and the level expanse of prairie gives every facility for railway construction.

(4) It has the rich coal-fields of Indiana and Illinois behind it, and is within easy reach by water of the iron, copper, and timber of Michigan.

(5) It is the greatest railway centre, the greatest grain market, the greatest pork market, and one of the greatest lumber and cattle markets in the New World.

(6) The presence of such a huge population in the centre of a timber area has given rise to an enormous furniture industry, and the demand for railway stock and agricultural implements is at least equally great. Naturally, too, in a cattle and timber market, there is an important leather industry.

(7) As a great railway junction so near the Michigan ore, it has also developed very large iron and steel works—specialising in rails and locomotives.

3. St. Louis, though only about one-third the size of Chicago, has a position of great importance, and its trade resembles that of Chicago.

(1) It is the mathematical centre of a huge area of very rich country, being half-way between the Rockies and the Atlantic and half-way between Lake Superior and the Gulf of Mexico. This gives it exceptional advantages for collecting and distributing goods.

(2) The level of the land, and the fact that for many years St. Louis was the lowest point at which the Mississippi was bridged, made it a great railway centre; and these southern railways are never blocked by snow.

(3) Being just below the confluence of the Missouri and the Mississippi, it has special advantages for river shipping.

(4) With a rich grain area to the north-west and a rich tobacco area to the south-east, it specialises in flour-milling and manufacturing tobacco.

4. Buffalo is not nearly so large as St. Louis, being at present no larger than Belfast; but it is growing very rapidly.

(1) It is the most easterly port on Lake Erie, and the western terminus of the Erie Canal; and thus it commands the whole trade along the canal between the Great Lakes and New York.

(2) It stands on the edge of the Pennsylvanian coal and iron field, and is only 22 miles from the enormous water-power of Niagara—from which the street cars and mills are already being worked.

(3) It commands the cross trade between the densely-peopled areas of Ontario and New York State, and the railway traffic along the south bank of the St. Lawrence.

5. Of the other five Lake ports, Cleveland, Detroit, and Milwaukee are much the largest.

(1) Cleveland, which exceeds Buffalo in population, has such a good harbour that it has attracted practically all the lake trade of eastern Ohio in coal, iron, and oil.

(2) Detroit, which is rather larger than Bristol (350,000), commands the "through" lake traffic and the "north shore" railway traffic between Chicago and Ontario *via* the St. Clair tunnel. Its importance as a railway junction, and its easy access to the Michigan iron and timber, account for the large manufacture of railway stock.

(3) Milwaukee, which is nearly the size of Detroit, has direct water communication with the Mississippi; it commands the lumber, grain, cattle, and hop trades of southern Wisconsin; and, in connection with the grain and hops, it has an immense brewing industry.

6. Toledo is only half, and Duluth is only a quarter, the size of Detroit; but Duluth at least must become a very important centre.

(1) Toledo, which is about the size of Oldham or Sunderland, stands where the main line from Buffalo and Cleveland to Chicago and the West crosses the navigable estuary of the Maumee River; it has an oil industry of its own, and is the natural outlet eastward for the grain and lumber of northern Indiana.

(2) Duluth is at present not much larger than Cork or Ipswich, but it is growing very rapidly; it is the farthest inland of all the ports, and thus has been made the terminus of the Northern Pacific Railway (N.P.R.); it commands all the wheat and iron trade of central Minnesota, and a great deal of the through traffic along the N.P.R.

7. The Pacific has only three commercial centres—the Golden Gate, the estuary of the Columbia, and Puget Sound.

(1) San Francisco occupies a peninsula on the south, *i.e.* the sheltered side of the Golden Gate, where it has a delightful climate and every facility for commerce except coal. All the railways from north, east, and south must converge on the Golden Gate to reach the Pacific.

The harbour has immense wealth behind it in wheat, fruit, and wool, and to a less degree in precious metals; it monopolises the growing U.S.A. trade with China and Japan, and has a distinct "Chinese quarter." Its population is as large as that of Bristol.

(2) Puget Sound is one of the finest natural harbours in the world. Seattle, which is as large as Cork or Northampton, controls the vast fishing industries of the Sound, the wheat trade from the clay lands of eastern Washington, and the general trade eastward.

Tacoma, which is as large as Colchester or Londonderry, controls the timber trade from the rainy hills of western Washington.

(3) Portland, which is rather larger than Seattle, stands at the confluence of the Columbia and the Willamette, where it is the eastern terminus of ocean navigation and the western terminus of the N.P.R.

It controls the wheat trade down the Columbia valley from eastern Oregon, the through trade down the Willamette valley from San Francisco, and the timber trade of the Cascade Mountains, as well as the salmon and shipping industries of the Columbia.

The chief canning centre is Astoria, the nearest port to the tin mines of the Malay Peninsula.

Lesson 27—Surface and Vegetation

1. The "relief" of the United States is essentially typical of North America—a huge low plain shut in by a low mountain system on the east, and by a high and massive mountain system on the west (cf. p. 9); but it has a few important variations from the "relief" of Canada.

(1) The general slope of the plain is from north to south, not from south to north; this has the advantage of being from a colder to a warmer latitude, and it naturally takes both river and rail traffic to the Gulf coast.

(2) The country is entirely within really temperate latitudes, and extremes of climate must be due to other causes than latitude.

(3) It has its chief plateau system in the west, not the east, which indirectly causes the chief water-parting to be deficient in glaciers; and, therefore, the rivers vary greatly in volume.

2. The vegetation, of course, varies with the soil and the climate; but the five great commercial products are grain, pasture, fibres, fruit, and timber.

(1) The grain and pasture come mainly from the Mississippi basin.

(2) The fibres and fruit come mainly from the eastern coast-lands.

(3) The deep valleys of the Pacific coast also produce very fine grain and fruit.

3. The grain varies, with the soil and the climate, from rye to rice; but wheat and maize are much the most important—the maize being the more abundant, but the wheat the more important for export.

(1) The volcanic plateau of Oregon and Washington and the alluvial plain of Minnesota produce the best wheat, but the largest amount comes from Dakota, Ohio, and Indiana.

Duluth and Milwaukee are the natural outlet for the Minnesota and Dakota grain, and Chicago and Toledo for that of Indiana and Ohio; but a very large quantity goes by rail to New York, even from Dakota—to save trans-shipment.

(2) Maize, the only indigenous grain of the New World, and the most important for the U.S.A. home market, requires more heat and more moisture than wheat; and, therefore, it is grown mainly on river "bottoms" south of the wheat area.

The most productive areas are the south of Iowa between the Missouri and the Mississippi, the "peninsula" of Illinois between the Ohio and the Mississippi, and the whole State of Missouri, in which the three rivers meet; but it is also grown in the "peninsula" of Nebraska and Kansas that is shut in by the Platte, the Missouri, and the Arkansas.

It is convenient access to these enormous stocks of maize that has made Chicago and Cincinnati the two largest "hog" markets in the world.

(3) Oats for horses and barley for brewing are largely grown in the densely-peopled States along the Great Lakes; very fine barley is also grown in California, and rice is grown in the Louisiana swamp, though it is gradually being displaced by sugar-cane.

N.B.—The two barley districts also grow large quantities of very excellent hops, of which there is even an export to England.

4. The great pasture area is the tract of rolling grass-lands west of the Mississippi, which stretch from Iowa to Texas and from New Mexico to Missouri. It already supports 40,000,000 cattle, and could support twice as many.

(1) A large number of cattle are also raised round Lake Michigan—in Ohio, Indiana, Illinois, and Wisconsin.

(2) Besides these cattle, a very large number of sheep are raised in the more mountainous States farther west, from Montana to New Mexico and from Wyoming to Oregon; and the finest wool on the continent comes from the Oregon and Californian sheep-farms.

(3) The great local markets are Kansas City, Dallas, and Omaha, which sprang into importance as soon as railways from the east reached them.

5. The chief fibres are cotton, tobacco, and flax.

(1) The flax, which is the hardiest and the least important, comes mainly from Minnesota.

(2) The cotton, which is the least hardy and the most important, comes mainly from Texas, Georgia, Mississippi, Alabama, and South Carolina. Cf. p. 30.

(3) The tobacco comes mainly from Kentucky, Virginia, and their southward neighbours, Tennessee and North Carolina.

6. The chief fruits are apples, oranges, and grapes.

(1) The best apples come from New York, Delaware, and Pennsylvania. Cf. p. 49.

(2) The oranges come almost entirely from Florida.

(3) The best grapes come from California, where they are converted largely into wine, raisins, and brandy.

N.B.—California also grows splendid pears and prunes, and Delaware grows peaches.

7. The timber comes mainly from the north-east and north-west corners of the country, where there is the heaviest fall of rain and snow; but large quantities

come from the Michigan and Florida peninsulas, which naturally have a very moist atmosphere.

(1) The chief timber States are Maine, Michigan, and Washington.
(2) The chief timber centres are Saginaw and Bay City, both on the Michigan peninsula.
(3) Florida produces the so-called "cedar" or juniper, which is shipped from Pensacola and Jacksonville to the various pencil-making centres of Europe.

Lesson 28—Minerals

1. The mineral wealth is very great and well distributed, and includes all the most useful minerals except tin. Cf. p. 32.

(1) The country produces more copper and more quicksilver than any other country in the world.
(2) Roughly, it may be said, fuels are produced in the east, precious metals in the west, and the ordinary commercial metals in the middle.
(3) Some deposits of tin are said to have lately been discovered along the Colorado River in Texas.

2. There are two fields of real coal, the Alleghany and the Central, of which the former is much the larger and the more valuable.

(1) The Alleghany coals are of three kinds: anthracite to the east of the mountains, bituminous to the west, and semi-bituminous between the other two.
(2) The anthracite lies along the banks of three rivers: along the Susquehanna between Scranton and Wilkesbarre, along the Lehigh round Manch Chunk, and along the Schuylkill round Pottsville; and, as both the Lehigh and the Schuylkill are tributaries of the Delaware, the coal has easy access to Philadelphia. Cf. p. 63.

(3) The semi-bituminous coal is most abundant along the Potomac at Cumberland, but the field is not a large one.

(4) The bituminous coal is found along the whole length of the western slope of the Alleghany Mountains, from Pittsburg to Birmingham, and is everywhere on or quite near to navigable water. The richest deposits are along the Ohio and the Monongahela, especially round Pittsburg, Wheeling, and Connellsville; but the Alabama deposits are proving much richer than was expected.

(5) The central field is much smaller and less valuable, but is very useful to Chicago and St. Louis. Its centre is at Terre Haute, where the railway from Indianapolis to St. Louis crosses the Wabash River.

3. Besides this large supply of coal, there are also most valuable supplies of oil and natural gas, both of which are so clean and so cheap that they are taking the place of coal, especially in iron and glass works, throughout the entire west of Pennsylvania and a large proportion of Ohio.

(1) The gas is most abundant round Pittsburg.

(2) The oil, which is of an exceedingly good quality, is most abundant in the valley of the Alleghany River and along Lake Erie, especially round Bradford, Cleveland, and Oil City. It is conveyed in pipes for hundreds of miles, *e.g.* to Philadelphia.

4. There is abundance of good iron ore in both the great coal areas, but the richest deposits are along Lake Superior.

(1) The Michigan centre is Port Marquette. Cf. p. 33.

(2) The Alleghany centres are along the Ohio between Ironton and Marietta, and in the upper basin of the Alabama round Birmingham and Tuscaloosa.

(3) As almost the whole Alleghany region is rich in good limestone, "flux" can be got easily everywhere.

5. The precious metals come almost entirely from the Cordilleran system.

(1) The gold output was valued in 1908 at £20,000,000. Colorado, Alaska, Nevada, and California are the chief sources of supply, and South Dakota, Idaho, and Arizona produce about one-fifth of the total between them. By far the richest mines are at Cripple Creek, in the Pueblan corner of Colorado.

2) The silver output was valued in 1908 at £14,500,000; the chief producers were Montana and Colorado, and the special centres were Leadville and Butte City.

N.B.—Leadville, as its name implies, produces lead as well as silver; and Butte City practically shares with the Calumut district of Michigan and the Tucson district of Arizona the huge copper trade of the States.

Lesson 29—Towns and Industries (1)

1. As in Canada, the importance of the towns cannot always be fairly gauged from their population.

(1) Very important sites have not yet become populous.

(2) The export of raw materials is more important in most places than domestic manufactures.

(3) Consequently, the coasts are relatively more important at present than the coal-fields, and harbours have matured more quickly than manufacturing centres.

2. The last census showed that there were 70 towns with a population of over 50,000.

(1) Of these, 39 had a population of more than 100,000, *i.e.* were larger than Southampton or Cork; and of the 39, 19 had more than 200,000, *i.e.* were larger than Portsmouth or Leicester.

(2) Of the 19, 6 had more than 500,000, *i.e.* were larger than Leeds; and of the 6, 3 had more than 1,350,000, *i.e.* were at least three times the size of Leeds.

(3) The growth of population in many places since the previous census (1890) has been very rapid; for

instance, Chicago has risen from 1,100,000 to 1,900,000, and was estimated at over 2,000,000 in 1906.

3. Of the 19 cities that have more than 200,000 inhabitants, as many as 14 are harbours. Cf. p. 62.

(1) New York, Chicago, and Philadelphia vary from three times down to twice the size of Manchester.

(2) Brooklyn, the chief suburb of New York, is more than twice the size of Leeds.

N.B.—Of the other suburbs, Newark is as large as Nottingham, and Jersey City is as large as Leicester.

(3) St. Louis and Boston are considerably larger, and Baltimore is rather smaller, than Birmingham.

(4) Cleveland, Buffalo, and San Francisco are all larger than Edinburgh or Bristol.

(5) Milwaukee, Detroit, and New Orleans are rather larger than Bradford or West Ham.

(6) Newark and Jersey City have nearly all the advantages of New York, and the additional advantage of being on the landward side of the harbour, and thus having direct rail inland without tunnelling. Jersey City is the terminus of the great trans-continental lines; and both places manufacture luxuries for New York, specially jewelry and patent leather.

N.B.—Contrast the comparative insignificance of the political capitals of most of the States, though their central positions may eventually make them important railway junctions. Cf. Lesson 31.

4. The five cities which are not recognised harbours are Cincinnati, Pittsburg, Washington, Louisville, and Minneapolis; and, as a matter of fact, all five are on navigable water.

(1) Cincinnati stands on the north bank of the Ohio, at the north-east corner of the great maize area of the Mississippi basin. This position made it an important place in the days when the Ohio separated the "slave"

States of the south from the "free" States of the north, and in later times made it a natural food centre for the mining area of the upper Ohio—the speciality in a maize and oak district being naturally pork. Cf. p. 81.

(2) Pittsburg stands at the confluence of two navigable rivers in the centre of a coal, iron, oil, gas, and limestone district; and thus it has become a very important industrial centre, with the largest iron, steel, and glass industries in America—excellent glass-sand being found in the upper valley of the Ohio.

(3) Washington, on the contrary, has entirely neglected its geographical and commercial advantages, and owes its population to its political importance as the capital of the republic. It is a beautiful city on the broad Potomac River, exactly 77° west of Greenwich. The "Capitol," in which Congress meets, is one of the finest buildings of its kind in the world.

(4) Louisville, which is about the same size as Leicester, stands where the Ohio rapids cause a diversion of traffic, except when the river is in flood; and the fertility of the Kentucky "blue limestone" has given it the trade of a magnificent pasture and fibre district, the special products being horses and tobacco. The town also shares in the glass-trade of New Albany.

(5) Minneapolis and St. Paul now form, industrially, a single centre. They stand 8 miles apart just below the St. Anthony Falls on the Mississippi, at equal distances from the Atlantic, the Pacific, the Hudson Bay, and the Gulf of Mexico; and thus they have become a great transport centre.

They are so near to the Great Lakes that their railway rates have to compete with the rates by water, and there is the further competition of three railways from St. Paul to Duluth; and, as they are in the centre of the richest wheat area in the States, they have become one of the most important grain and flour markets in the world.

Minneapolis has the advantage of being the nearer to the Falls, which supply the mechanical power for the mills, and which are the actual head of navigation; St.

Paul has the advantage of having the deeper water, as the Minnesota tributary joins the Mississippi below Minneapolis, and of being on the Duluth side of the

Lesson 30—Towns and Industries (2)

1. Of the twenty cities with a population of from 100,000 to 200,000, five (including St. Paul, cf. § 5 above) have over 170,000.

(1) Indianapolis stands on the edge of the central coal-field, in the middle of half-a-dozen extremely important towns—Chicago, St. Louis, Cincinnati, Cleveland, Pittsburg, and Louisville. It is a junction for at least 15 main lines of rail.

(2) Providence, a safe harbour, is about as large as Oldham or Dundee. It was originally a place of refuge for persons who were persecuted by the Puritans; but its position, where the coast railway from New York to Boston crosses the top of Narragansett Bay, has made it a very important manufacturing centre. It specialises in the two great necessaries—cotton and woollen goods, and in jewelry.

(3) Kansas City stands in the west of the great maize area and the east of the great cattle area of the country. It is a very important railway junction, and the down-hill grade enables very heavy trains to be run to the Gulf ports. The climate is very healthy, the death-rate being only 11·50 per 1000; and the dry air and the abundance of grain make it one of the greatest egg markets in the world, with a production of about *twenty-one and a half million dozen* per year.

N.B.—Of course, it ought to have excellent navigation up and down the Missouri, but it stands just where the Kansas and the Missouri drop on to the "bottom" lands, and where, therefore, they deposit so much mud that almost no use is made of the waterway.

(4) Rochester owes its importance to the Genesee Falls, which drive huge flour-mills, and to its facilities for exporting the flour either *via* the Erie Canal or *via* Lake Ontario, from which it is only 7 miles distant.

2. Five cities (including Toledo, cf. p. 69) have populations varying from 145,000 down to 120,000.

(1) Denver stands where several railways converge to cross the Rockies, by the South Platte valley, to the great silver district of Leadville.
(2) Alleghany, which is only as large as Norwich or Derby, is a twin town with Pittsburg, and has direct communication by river and canal with Lake Erie; it is by this route that the Michigan iron ore reaches Pittsburg.
(3) Columbus, the political capital of Ohio, is in the very centre of the State, and has thus become an important railway junction.
(4) Worcester, on the crest of the watershed which supplies eastern Massachusetts with mechanical power, is on the main line west from Boston, and makes machinery for the large textile industries of the State.

Lesson 31—Towns and Industries (3)

1. Nine towns have populations of rather more or rather less than 110,000.

(1) Syracuse stands on the main line from Boston to Buffalo, in the rich salt area round the junction of the Erie and Oswego canals.
(2) New Haven is a harbour on Long Island Sound which is completely overshadowed by the proximity of New York; it has very large oyster-beds, and manufactures metal goods. It is the seat of Yale University.
(3) Paterson, which is practically an inland suburb of New York, specialises in silk goods.
(4) Fall River, like Lowell, is one of the great cotton centres which have made Massachusetts the first textile State in the Union. Its climate is much more favourable for textiles than that of the inland towns.
(5) St. Joseph is an important grain centre on the Missouri, with a very large wholesale trade.

(6) Omaha stands where the direct line from Chicago to San Francisco crosses the Missouri, and begins to climb the Platte valley; it has very large engine works, the river is navigable, and the maize lands round support a large "hog" trade. It is also a great cattle market.

(7) Los Angeles is the largest town in the south of California, and has a busy fruit market.

(8) Memphis is a river-port which ships the cotton and tobacco of western Tennessee to New Orleans; and the construction of the new bridge across the Mississippi has attracted all the southern trans-continental railway traffic, to the prejudice of towns like St. Louis. It stands, like Vicksburg, on a bluff, which offers special facilities for bridging the river.

(9) Scranton is an important station where the main line from New York to Buffalo enters the anthracite coal-field of the Susquehanna valley.

2. Eight towns (including Portland and Seattle, cf. pp. 64 and 69) have populations of about 90,000.

(1) Lowell is the most important of several towns—including Manchester, Nashua, and Concord—which use the enormous water-power of the Merrimac in manufacturing cotton. [Estimated at 100,000 in 1903]

(2) Albany, the political capital of New York State, stands where the main line from Boston to Buffalo crosses the Hudson River just below the head of navigation; and the confluence of the Mohawk and the Hudson gives special facilities for rail and canal to Montreal and Buffalo.

(3) Cambridge is simply a suburb of Boston, and contains the great university of Harvard.

(4) Atlanta, the political capital of Georgia, like its neighbour Augusta, uses the water-power of the Blue Ridge in manufacturing the local cotton; and its height makes it much more healthy than the other towns of Georgia. It stands where several railways converge to pass round the end of the Appalachian Mountains.

(5) Grand Rapids stands on the western edge of the magnificent forests and rich salt-beds of the Michigan peninsula, just where the railway from the great meat-packing metropolis of Chicago crosses the Grand River. It sends timber to Chicago, and has a huge furniture industry of its own.

(6) Dayton is an important junction where the main line west crosses the Miami River. It shares in the special trades of Cincinnati, and uses the hard-wood of Ohio in the manufacture of agricultural implements. The oak forests also supply splendid feeding-ground for immense herds of swine. Cf. p. 76.

3. Nine towns have populations of rather more or rather less than 80,000.

(1) Richmond, the political capital of Virginia, is the most convenient centre for the three great "tobacco valleys" of the James, the Roanoke, and the Rappahannock, and has very large tobacco factories. It is at the head of tidal water on the James River.

(2) Nashville, the political capital of Tennessee, stands in the centre of the State on the Cambridge River, between the mineral wealth of the upper Tennessee plateau and the agricultural wealth (tobacco and cotton) of the Mississippi lowlands.

(3) Hartford is the political capital of Connecticut, and stands at the head of steamboat navigation.

(4) Wilmington is an important ship-building centre on the Delaware estuary, where it has easy access to splendid coal and iron; and it has the largest gunpowder works in America.

(5) Reading is on the edge of the anthracite coal-field in the Schuylkill valley.

(6) Camden is an important railway centre on the Delaware estuary just opposite Philadelphia, and commands the huge fruit and vegetable trade of the "market-garden of New Jersey" across the estuary to the dense population in and round Philadelphia.

(7) Trenton, which stands on the isthmus at the head of the estuary, is the natural political capital of the State, and commands a similar fruit and vegetable trade to New York. It also has a very large brick and pottery industry of its own in connection with the rich clay-beds of New Jersey.

(8) Bridgeport is a harbour on Long Island Sound near the mouth of the river on which the famous Waterbury watch factories stand.

(9) Troy is at the head of navigation on the Hudson, and thus has been made the eastern terminus of the Erie Canal. It also utilises the falls in various industries, including hardware.

4. Nearly twenty other towns (including Charleston, Duluth, and Savannah, cf. p. 65) have over 55,000.

(1) Most of them, *e.g.* Lawrence, New Bedford, Hoboken, and Manchester, are in the great north-eastern textile area.

(2) Others are engaged in the hardware trades of the same north-eastern area, *e.g.* Springfield (U.S.A. Armoury) and Utica.

(3) Lynn is practically a suburb of Boston, and has a very large boot and shoe industry.

(4) Oakland is the residential quarter of the rich San Francisco merchants.

(5) Des Moines, Evansville, and Peoria are important grain centres, Peoria being also a busy railway junction.

(6) Salt Lake City, besides having historic interest, is an important railway centre.

(7) Lincoln is the chief railway centre in the grain area of south-eastern Nebraska.

5. Among smaller, but still important, centres, are San Antonio, Houston, Dallas, Chattanooga and Little Rock.

(1) Dallas is a grain, and San Antonio and Houston are railway, centres in Texas.

(2) Little Rock is the political and commercial capital of Arkansas. Being in the middle of a cattle and cotton district, it makes very large quantities of oil-cake.

(3) Chattanooga is in the Alabama iron district.

N.B.—An inland town which has no navigable river, generally specialises on small articles. Cf. the screws and nails of Birmingham, and the toys and clocks of Nürnberg.

6. Key West, Burlington, and Rutland have between 10,000 and 20,000 inhabitants.

(1) Key West is a coral island, and ships sponges, oranges, and timber.

(2) Burlington is the best harbour on Lake Champlain, and has a lumber trade.

(3) Rutland is the site of the great marble quarries of Vermont.

NOTE

Several of these towns have grown very rapidly recently, *e.g.* Kansas City (estimated at nearly 190,000), Memphis and Omaha (over 125,000), Atlanta (105,000), etc.

MEXICO

Mexico, about 19° N. (=Bombay).

Lesson 32—Surroundings and Surface

1. Mexico has a land frontier on the north and the south; but the southern frontier, owing to its shortness and its position, has practically no effect on either commerce or climate. The country may therefore be said to have sea on every side except the north.

(1) The coast is very long in proportion to the area, but not much broken.

(2) At the two extremes—the south-east and the north-west—it ends in the peninsulas of Yucatan and Lower California, enclosing the gulfs of Campeachy and California.

(3) The land frontier is only 125 miles in the south, but four times as much in the north.

2. There are several marked differences between the two coasts.

(1) The west coast is more than twice as long as the east, and half of it is outside the Tropics.

(2) The west coast is high and rocky, with one or two really fine bays; the east is low and fringed with sand-banks, and has not a single natural harbour.

(3) The west coast is exposed and comparatively healthy, while the east is shut in and awfully unhealthy.

3. The chief ports on the east coast are Vera Cruz and Tampico, both of which have been provided with artificial harbours. Cf. Coatzacoalcos, p. 89.

(1) Vera Cruz stands in the centre of the Gulf coast, and has behind it the densest population of the country,

including the cities of Mexico and Puebla; but its climate is so bad that its population is less than 25,000. In fact, it is simply a filthy, fever-haunted gateway to the plateau; and the same is true of nearly all the harbours.

(2) Tampico is in a rich agricultural district with very valuable minerals behind it, and—for Mexico—it has easy communication inland by rail to St. Luis Potosi, the great railway junction on the eastern edge of the plateau. It is becoming more important than Vera Cruz.

N.B.—The railway from Vera Cruz to Mexico ascends more than 8000 feet in 80 miles!

(3) On the Yucatan peninsula there are the two roadsteads of Campeachy and Progresso, both connected by rail with the great henequen district of Merida.

4. The chief harbours on the west coast are Acapulco and Mazatlan. Cf. Salina Cruz, p. 89.

(1) Acapulco is a fine natural harbour exactly on the meridian of 100° W.; and, as it is much less shut in than Vera Cruz, it has a much better climate. Its commercial importance is greatly injured by the extremely difficult communication inland.

(2) Mazatlan owes its importance partly to the fertility of the lowlands behind and to the north of it, partly to its position at the entrance to the Gulf of California, and partly to the mineral wealth of Sinaloa.

(3) San Blas and Manzanilla, by being connected with Mexico by rail, have become termini of trans-continental routes; and Guaymas has easy access by rail into the United States, the junction with the Southern Pacific Railway being at Benson.

5. The mass of Mexico is a high triangular plateau shut in by a low strip of narrow plain along each coast.

(1) The plain along each coast is divided from the plateau by a mountain chain, that on the west being the Sierra Madre.

(2) The plateau sinks and broadens from the great peaks of Popocatepetl and Orizaba down to the valley of the Rio Grande.
(3) The longest rivers must therefore flow northwards, and will probably empty into lakes, fresh or salt.
(4) South of the highest peaks lies the lowest depression, the Isthmus of Tehuantepec.
(5) The peninsula of Lower California is a barren "sierra," and that of Yucatan is a forest-clad plateau.

6. The climate varies, with the height, from tropical heat to perpetual snow, and, with distance from the sea, between extremes of damp and drought.

(1) A large portion of the country is in the Tropics, but its great average height materially modifies the heat.
(2) As the mountains run parallel to the coasts, they prevent wet winds from penetrating inland; and the dry climate is very healthy, counteracting even the filthy habits of the people, but it necessitates irrigation for successful agriculture.
(3) The low level, the great heat, and the heavy rainfall make the coast strip very fertile, but terribly unhealthy; and, therefore, nearly the whole population lives on the plateau.
(4) In the north the distance of the interior from the sea, the presence of mountains parallel to the coasts, and the absence of mountains along the U.S.A. border cause great drought and extremes of climate similar to those of Arizona and New Mexico.
(5) The heat and the height cause such rapid evaporation that the temporary lakes of the rainy season are soon converted into salt marshes.
(6) The intense heat of the Great Basin of California, like that of the Tibet Basin, causes a monsoon wind in summer; and, therefore, there are only two seasons—wet and dry.
(7) The Mexicans themselves call the low unhealthy area *tierras calientes*, the general plateau *tierras templades*, and the region about 8000 feet *tierras frias*—*i.e.* "hot," "temperate," and "cool" lands.

Lesson 33—Productions and Towns

1. The vegetation, of course, varies with the climate and the soil—the latter being largely volcanic, and therefore very fertile.

(1) The "hot lands" are covered with forests—of mahogany, logwood, rosewood, ebony, etc., and produce all sorts of tropical vegetation.

(2) The "temperate lands" are covered with various species of cactus, on some of which the cochineal insect feeds, and produce maize, beans, and agave, for the dense population on them.

N.B.—Maize and beans are the chief food, and agave makes "pulque," the national drink.

(3) The "cool lands" produce wheat and barley, and have splendid natural pastures for cattle.

2. The tropical vegetation includes coffee, cotton, cacao, vanilla, sugar, bananas, tobacco, rubber, jalap, and henequen. Cf. Lessons 37 and 38.

(1) The coffee and bananas are grown on the forest-clad seaward slopes of the mountains, the cacao and vanilla on the sheltered strips of volcanic plain, and the sugar and tobacco on the parts of the exposed coastal lowlands that are rich in lime, *e.g.* the Vera Cruz district.

(2) The henequen and cotton are grown round the Gulf of Campeachy, the former in Yucatan and the latter where the water-power for manufacturing is greatest—behind Vera Cruz. The most important for export is the henequen, which is both cheaper and stronger than jute.

(3) The rubber grows best on the isthmus of Tehuantepec, and the jalap on the mountains round Xalapa—from which place, indeed, the drug takes its name.

3. The mineral wealth is very great, especially in silver, along with which lead is found. The other

most important products are gold, sulphur, iron, and coal.

(1) The silver is found in two main areas. One is along the Central Railway from Zacatecas to Mexico, especially between Zacatecas and Guanajuato; and the other is in the valley of the Pesquerto, especially near Monterey.

(2) The largest amount of gold is also found—along with very pure copper—round Guanajuato.

(3) The coal is found on both the northern edges of the plateau—in the east where the International Railway to San Antonio, U.S.A., crosses the Sabinas River, and in the west behind the harbour of Guaymas in the valley of the Rio Yaqui. It is of poor quality, but is very useful to the railways—on which so much depends in the absence of navigable rivers.

(4) The iron, which is of superb quality, is found in enormous quantities on the slopes of the Sierra Madre, especially round Durango.

(5) The sulphur is found perfectly pure in the crater of Mount Popocatepétl, and the export of it is a special industry in Puebla.

4. There are six towns with a population of over 50,000.

(1) Mexico, with 370,000, is about the size of Belfast. It stands on Lake Tezcuco, a mile and a half above the sea, half way between the Atlantic and the Pacific coasts. It is the political capital and the great railway centre of the country.

(2) Guadalajara and Puebla have respectively just over and just under 100,000 inhabitants, *i.e.* they are the size of Halifax and Huddersfield. Besides its sulphur and textile (cotton) industries, Puebla collects the maize and agave of the rich volcanic valley up which the railway from Vera Cruz to Mexico (*via* Puebla) runs.

Guadalajara stands on the continuation of the same line to San Blas, just where the Santiago River begins to descend from the plateau.

(3) S. Luis Potosi, Monterey, and Leon have populations of about 60,000, *i.e.* the same as Wigan. S. Luis is the junction for traffic from the plateau to Tampico; and Leon, amongst the rich pastures of the central plateau, has a very large leather industry.

(4) Guanajuato, Pachuca, and Morelia—the two former being silver towns, and the last a great sugar-growing centre—have populations of about 40,000.

(5) Aguas Calientes ("Hot Springs"), Oaxaca ("Acacia-clearing"), and Merida, the centre of the great henequen district of Yucatan, have about 35,000. Queretaro, the centre of the famous "opal" industry, and Zacatecas, another "silver" town, have also over 30,000.

(6) The terminal ports of the new trans-continental railway across the Isthmus of Tehuantepec, Coatzacoalcos ("Port Mexico"), and Salina Cruz, are likely to increase greatly both in importance and in population.

CENTRAL AMERICA

18°-8° N. (=Bombay to Cape Comorin).

Lesson 34—General Geography

1. The five Republics of Central America are mongrel caricatures of the United States; and their land is subject to all the vast, terrible, and unreliable phenomena characteristic of mountainous areas near tropical seas—*e.g.* earthquakes, volcanic eruptions, sudden thunder-storms, etc.

(1) Like the similarly placed Republics of South America, therefore, they afford some valuable object-lessons in political geography.

(2) The political disquiet of their peoples is simply the counterpart of the physical disquiet of their land.

N.B.—Revolutions are almost as common as earthquakes.

(3) Earthquakes are caused by a change in the weight of the earth's crust, and this itself is caused mainly by the removal of masses of soil from mountain tops to the ocean floor.

N.B.—Contrast the freedom from earthquakes on low inland plains in temperate latitudes, *e.g.* Russia or Canada.

2. The coast line is very long in comparison with the surface, and the eastern portion differs considerably from the western.

(1) The western is a more or less straight strip of steep cliffs, with deep ocean water immediately off it and with a range of mountains immediately behind it.

(2) The eastern is divided between the long Bay of Honduras and the low "Mosquito" swamps, and opens on a very shallow portion of an inland sea.

(3) *The best harbours are, therefore, on the Pacific;* but those which face the West Indies and Europe, have at present most trade.

3. The surface is generally a rough high plateau, bordered along the Pacific coast by parallel ranges of mountains and along the Gulf of Mexico by a broad low swampy plain.

(1) Many of the mountains are volcanic, which accounts for their rapid "weathering," and thus for the richness of the lowland soil; and some of them reach a height of 13,000 feet, *i.e.* four times the height of Scawfell or Ben Lomond.

(2) Their height, their direction, and their nearness to the sea cause a very heavy rainfall, which materially hastens the "weathering" and removes the "weathered" soil; and, therefore, the rivers, though not long, have a great and constant volume. The longest is the San Juan, which is about half as long as the Thames.

(3) The deep depression across the south of Nicaragua has accumulated enough water to form the large but shallow lakes of Nicaragua (115 miles long by 45 miles broad) and Managua (35 by 20).

4. The intense heat and heavy rainfall make the climate very unhealthy except on the higher levels, but it also makes the rich volcanic soil produce most luxuriant vegetation. Cf. Lessons 37 and 38.

(1) Forests of valuable cabinet and dye woods—such as mahogany, rosewood, logwood, and fustic—cover almost the whole area, and are mainly responsible for the appalling superabundance of offensive insects. Cf. the name "*Mosquito*" *coast.*

(2) The forest-clad seaward slopes of the lower ranges form an excellent site for coffee trees. Costa Rica is even called "the Coffee Republic."

(3) The low coast plains offer an equally good site for sugar-cane, and the sheltered volcanic valleys for cacao.

(4) The high western plateau supplies magnificent pasture for cattle, which accounts for the large export of cattle and hides and for the local leather industries.

(5) Bananas and maize are grown nearly everywhere; good tobacco comes from the eastern lowlands of Honduras, and the best indigo in the world from the lowlands of San Salvador.

5. The mineral wealth is probably very great, and is known to include silver, gold, and zinc; but it is quite undeveloped.

(1) The mines nearest to navigable water, and therefore the most worked hitherto, are the gold mines of the Mosquito Reserve, just behind Blewfields; but the richest seem to be the silver mines of Honduras.

Lesson 35—Individual States

1. British Honduras is essentially typical of Central America. It has a low swampy plain along the sea and forest-clad mountains inland.

(1) The coast is fringed with coral "keys," amongst which turtles are very abundant.

(2) There are several navigable rivers, two of which, the Hondo and the Sarstoon, form convenient political frontiers on the north and the south. The most important river is the Belize, on the estuary of which stands the little town of Belize (= Dartmouth or Morecambe), the political and commercial centre of the colony.

(3) The forests supply mainly logwood and mahogany, the timber being cut in the dry season and floated down the rivers in the wet seasons; and the export depends on the height of the flood.

N.B.—The softening effect of the marshes rather spoils the quality of the mahogany.

(4) The forest area supplies also coffee, india-rubber, and rosewood.

(5) The lowlands produce henequen, sugar, and very large quantities of fruit, especially bananas and pineapples.

2. Guatemala is mainly one high plateau, and therefore has a comparatively healthy climate; it has access to both seas—the Pacific coast being much the larger, but the general slope of the country being towards the Gulf coast.

(1) On the Pacific, the roadsteads of San José and Champerico have railway communication respectively with New Guatemala and Quesaltenango; and the Gulf ports of St. Thomas and Livingston have easy access up the Motagua valley to New Guatemala, though the projected railway has not been built yet.

(2) The forest-clad slopes of the mountains, besides being very beautiful, produce very large quantities of coffee; and cacao, india-rubber, and bananas are being developed, but are practically waiting for transport.

(3) New Guatemala is sufficiently high and sufficiently sheltered from the wet Trade winds to be healthy, and has thus become the largest town in Central America—with a population of about 95,000.

N.B.—Old Guatemala was just at the foot of two volcanoes, but was destroyed so often that the capital had to be moved out on to the plateau.

3. Salvador consists of a low and very narrow coast plain backed by a rough volcanic plateau, which runs inland for about 50 miles, the sea-front extending for about 150.

(1) This coast plain, especially round Libertad, grows the famous "Balsam of Peru."

(2) As the high mountains behind the plateau completely shut out the wet Trade winds, the climate is perfectly healthy inland and not very unhealthy even on the coast. Consequently, the population is denser than in any other State of Central America.

(3) There are three ports—Acajutla, Libertad, and La Union, and three corresponding inland towns—Santa Ana, San

Salvador, and San Miguel. Both Acajutla and Libertad are connected by rail with San Salvador, the political and commercial capital, and Acajutla is also connected with the coffee centre of Santa Ana; La Union, the best harbour of the three, is to be connected with San Miguel.

N.B.—San Salvador, which has now a population of about 60,000, was shaken to pieces so often that its site was changed, but the new site is no better.

4. Honduras, like Salvador, is mainly a rough plateau. It slopes down to the north from a natural boundary of mountains along the Nicaraguan frontier, but it has a strip of coast along the Gulf of Fonseca.

(1) It has three harbours—Omoa, Truxillo, and Amapala. Omoa is the only one with any railway communication—though it has only 37 miles (to San Pedro Sula); Truxillo does the most trade at present, and Amapala is the best natural harbour.

(2) There are magnificent cattle pastures on the uplands, forests of mahógany and rubber along the Truxillo coast, and tobacco plantations west of Cape Gracias à Dios.

(3) The mineral wealth is considerable, and includes rich deposits of silver between Tegucigalpa and Amapala, but it is waiting for transport.

N.B.—The capital has been moved from the cattle centre of Comayagua to the mining centre of Tegucigalpa, which has now about 35,000 inhabitants.

5. Nicaragua is the largest of the Central American States, and has a larger coast, a more varied surface, and greater natural wealth than any of the others; but its advantages have hitherto been neutralised by its political disquiet.

(1) The Gulf coast is lined with salt lagoons, such as the Pearl and the Blewfields, which are of very little use; but the San Juan river provides a good harbour in Greytown, with deep water immediately off the shore.

On the west the Gulf of Fonseca and the Bay of Salinas are natural harbours, but are so far from populous centres that most of the traffic is done by Corinto, which has communication by rail up to Lake Nicaragua.

N.B.—The development of Brito depends on the Nicaraguan Ship Canal, which is not likely now to be constructed. Cf. p. 2.

(2) The surface presents the usual Cordilleran backbone and rough plateau flanked by low coast plains, but the plains are unusually broad. East of the mountains the land slopes gradually down into the low alluvial plain which merges in the Mosquito swamps; west of them there is the deep depression filled by the lakes.

(3) The climate is naturally very even and very unhealthy except in the great western depression, which is sheltered from the Trade winds by the mountains. Consequently, all the important towns are found in the west.

(4) The eastern plains support a very large number of cattle; there are dense forests in the centre, especially of fustic; and the rich western valleys raise almost every kind of tropical and semi-tropical vegetation, especially coffee, sugar, bananas, and tobacco.

(5) The eastward spurs of the mountains and the Mosquito Reserve are rich in minerals. Gold is mined near Blewfields and from Libertad to Matagalpa, the water-power of the Rio Grande being very useful; and silver is mined near Ocotal, where the Rio Coco provides water-power.

N.B.—The Coco, like the San Juan in the south, makes a convenient —because indisputable—political boundary.

(6) All the towns—Managua, Granada, Chinandega, Rivas, and Masaya—are in the west. The largest is the capital, Managua; but, even including the suburban population, it is no larger than Hereford.

N.B.—The old capital was Leon, which was a larger town, but it was so often shaken to pieces that it had to be abandoned.

6. Costa Rica consists of a lofty backbone of volcanoes flanked on the east by unexplored forests; the

climate is naturally very moist and mild, and the volcanic soil is extremely fertile.

(1) Coffee and bananas are the chief agricultural exports; cattle-rearing is an important industry, and the forests supply fustic and rubber.

(2) The mineral wealth is at last being worked, and is mainly in gold and silver; and the La Trinidad mines are proving so productive that they are beginning to justify the country's title of "The Rich Coast."

(3) The capital, San José, which is the same size as Managua and San Salvador, stands on the west—*i.e.* the dry and healthy—side of the mountains; but it has railway connection with the Gulf port of Limon *via* Cartago as well as with the Pacific port of Punta Arenas *via* Alajuela, and nearly all the bananas are exported from Limon.

N.B.—San José has been repeatedly destroyed by earthquakes.

7. Panama, which at present is independent of Colombia, owes its importance simply to its facilities for inter-oceanic commerce.

(1) The canal follows the general route of the railway from Colon to Panama town *via* the Col de Culebra Pass; and the difficulty of controlling the Chagres has been apparently met by the device of constructing a large lake, which will also allow vessels to travel much faster than they will be able to travel on the canal itself.

(2) Modern science and an absolutely despotic form of government have made the canal-zone one of the *healthiest* places in the world, with an average death-rate amongst white employees and their wives and children of *under 16* per 1000 (1907).

THE WEST INDIES

Lesson 36—General Features

1. The West Indies lie in a double curve from the peninsula of Florida to the mouth of the Orinoco, separating the deep basins of the Mexican Gulf and the Caribbean Sea from the Atlantic, and lying directly in the course of the Gulf Stream and of the north-east Trade winds.

(1) They have an aggregate area rather larger than that of Great Britain, and fall into four natural groups—the Bahamas, the Greater Antilles, the Lesser Antilles or Windward Islands, and the Leeward Islands.

(2) The Lesser Antilles are often divided into the Leeward (the northern) and the Windward (the southern) Islands, but such a division is absurd. All the group, from the Virgins to Trinidad, are in the very teeth of the Trade *winds*; and it is only the inner group along the Venezuelan coast that is to *leeward*.

(3) The name "West Indies" perpetuates the mistaken idea of Columbus that, when he reached the Bahamas, he had sailed round the world to India; and Antillia, or Anthelia, was the name given by the mediæval geographers to an imaginary land with which they filled up the unknown west—the region "away from the sunrise."

2. Almost all the islands—except the Bahamas—are mountainous, but have low coast plains.

(1) The Bahamas are a low coral group.

(2) The Greater Antilles—*i.e.* practically Cuba, Haiti, Jamaica, and Puerto Rico—have ranges running through them from east to west, and rising to over 7000 feet in Jamaica, 8000 in Cuba, and nearly 10,000 in Haiti, *i.e.* from more than twice to more than three times the height of Scaw Fell or Ben Lomond.

(3) The Lesser Antilles, which are really a line of volcanic peaks, rise to 4000 feet in St. Lucia, nearly 5000 in St. Vincent, and over 6000 in Dominica, *i.e.* from twice to three times the height of the Peak or Yes Tor.

3. All of the islands—except, again, in the Bahama group—are within the tropics, and have an essentially tropical climate.

(1) The tropical heat is, however, greatly modified by the daily sea-breezes, the Trade winds, and the considerable elevation.

(2) There are two seasons, the wet and the dry; the wet season lasts from May to December, and the dry season from December to May.

(3) If, in addition to the great heat and great moisture, there is also calm air for any length of time, the three conditions are present which give birth to hurricanes; and this often does occur in August and September, when the heat and the moisture are greatest.

(4) The direction of the mountains, and their nearness to the sea, cause them to present such a full face to the wet "Trades" at their wettest, that the rainfall on their windward side is excessively heavy; and, therefore, the leeward parts of the islands are much the healthier, especially in summer, and contain all the important towns.

(5) The force of the Trade winds has caused all the windward coasts to be clogged with driven sand, so that all the good harbours are also on the leeward side. Cf. p. 103.

N.B.—The most exposed islands are, naturally, the healthiest, *e.g.* Barbados, Antigua, and Dominica—the last combining exposure with height and with a very porous soil.

4. The soil is very fertile almost everywhere—except, once more, in the Bahamas.

(1) The coral formation of the Bahamas is covered with only a thin layer of sandy loam.

(2) The soil elsewhere is largely volcanic, and therefore needs only heat and moisture to make it produce enormous crops.

(3) In most of the islands there is also an immense natural supply of potash manure in the soil, in the form of vegetable refuse; and some of them, *e.g.* Sombrero, Redonda, St. Martin, Aruba, and Navassa, are rich in phosphates of lime. Cf. p. 107.

5. The hilly character of the islands aids the heavy rainfall in increasing the natural fertility of the volcanic soil.

(1) The heavy rain washes down to the roots of the plants a large quantity of the carbonic acid, ammonia, and nitric acid of the atmosphere.

(2) The porous soil sucks in the water before it can escape in surface floods. Contrast the Loire basin in France.

(3) At the same time, the general slope prevents the water from stagnating round the roots of the plants, and facilitates artificial drainage.

N.B.—The salt sea-breezes are favourable to the great staple—sugar.

Lesson 37—Vegetation (1)

1. With such a soil and climate, the vegetation is naturally very luxuriant, and includes almost all tropical plants. Sugar has hitherto been the great staple, but the industry has been greatly injured by—

(1) The unscientific culture;

(2) The incurable laziness of the emancipated negroes, and the ease with which in all the islands they can grow maize;

(3) The competition of beet-sugar, especially from Germany and France, where heavy bounties promote the export artificially.

2. Sugar is, however, like maize, a natural product of the West Indian soil and climate.

(1) It needs great heat and moisture, and is not injured by sea-winds.

(2) It grows best on low alluvial deposits of volcanic soil, where there is also lime.

(3) Cuba produces twice as much cane-sugar as any other country in the world — Java coming second; and Jamaica, Trinidad, and Barbados also produce large quantities.

N.B.—The amount of rum that can be made from 1 cwt. of sugar varies with the humidity of the climate and the season.

3. Tobacco has ranked next to sugar in the past; but, like the sugar, it is becoming of relatively less importance, and the recent political troubles in Cuba have done very great harm to the industry.

(1) The plant requires a light sandy loam, very rich in lime, potash, and forest refuse; and the climate must combine considerable moisture with lowland heat.

(2) The best cigar-leaf in the world has hitherto been grown in the Vuelta-abajo district, and Havana has thus become very famous for the manufacture of cigars; but, as the area is strictly limited, it is physically impossible for half the so-called "Havana" cigars that are in the European market, to have been grown in this district.

N.B.—There is a very significant *import* of tobacco from the Philippine Islands, Brazil, Germany, and elsewhere into Cuba!

(3) Tobacco is also grown in some of the other islands, *e.g.* Tobago, Trinidad, and Puerto Rico; and there is no reason why it should not be grown widely wherever the soil suits, *i.e.* on any forested coral formation, where it can get lime and vegetable soil.

4. In recent times coffee has become the greatest rival of the sugar and tobacco.

(1) There are two important varieties of coffee—the Arabian mountain plant and the Liberian lowland plant; the former does best at a height of from 3000 to 4000 feet, and the latter at a height of 1000 to 1200 feet.

(2) Both varieties have such long roots that they need a deep loose soil; and they prefer a rocky ground where there

is deep soil between the rocks, and where there is abundance of decayed vegetation, *e.g.* the site of a tropical forest on the side of a mountain.

(3) Both require great heat and moisture, such as are found on islands in the Trade-wind region; but they require protection—such as can be got on the leeward side of a forest-clad mountain—from very heavy rain and from strong winds.

(4) As the plant is grown so largely for export, the plantation should be as near the sea as possible—*e.g.* on a small mountainous island. Thus, Kingston stands below the leeward side of the forest-clad Blue Mountains, and Jamaica is the most sheltered of all the West Indian islands from the Trade winds.

(5) The Liberian coffee has several advantages; it is much the more prolific, though the berries do not give quite so much "clean coffee" to the bushel; its full crop comes in January, the dry season, instead of in August, the season of the hurricane rains; and the berries do not fall off the trees as soon as they are ripe, but can be gathered at leisure—a very important point where labour is scarce.

N.B.—Tea requires a precisely similar soil and climate except that the presence of iron is desirable, and both the Chinese mountain variety and the Assam lowland variety might be grown with assured success, *e.g.* on the iron-stored mountains of Cuba or the iron-stored lowlands of Guadaloupe; but it is unaccountably neglected.

5. Cacao has also become a very important product in recent times. The plant has been found growing wild in Jamaica and Martinique—the best proof that both soil and climate are favourable; and the cacao of Trinidad and Grenada actually ranks next to that of Venezuela in the market.

(1) Like the coffee, the tree has a long root, and needs a deep loose soil; and it prefers volcanic soil in a sheltered valley near, but not exposed to, the sea, with a southern or western aspect—*i.e.* in the West Indies, the leeward side of the mountains.

(2) Like the coffee, it is grown almost entirely for export, which is an additional reason for its being grown near the sea.

(3) Like the coffee, it also needs great heat and moisture, but it is an entirely lowland plant, and can flourish in a drier climate than the coffee—*e.g.* in Dominica and Grenada, if the soil and the aspect are very favourable.

(4) Like the coffee, it needs, too, protection, especially from hurricanes; and the young plants require shade, which can be well—and profitably—supplied by the banana. Cf. p. 103.

(5) The chief crop is gathered at Christmas, and a subordinate crop at Easter,—both, therefore, being gathered during the dry season.

Lesson 38—Vegetation (2)

1. The other characteristic products of the West Indies are fruits, spices, drugs, dyes, and certain food tubers.

(1) The fruits include oranges, limes, bananas, pine-apples, and coco-nuts.

(2) The spices include ginger, pimento, nutmeg, cinnamon, cardamom, vanilla, and pepper.

(3) The drugs include cinchona and castor.

(4) The dyes include anatto and logwood.

(5) The tubers include cassava, yams, tanias, and arrowroot.

2. Of the fruits the orange is the most important, especially in Jamaica, the Bahamas, and Dominica; and the West Indies have a great advantage over Florida in the entire absence of frost. Cf. p. 23.

(1) Like the coffee and the cacao, the orange has a long root and needs a deep soil; but its roots take such firm hold of the ground that the tree can withstand even hurricanes, and therefore can be planted as "shelter" for coffee and cacao trees.

(2) It grows well outside the tropics, *e.g.* in Sicily, but it is

much more prolific inside them; and the best fruit is raised in warm, moist, sunny spots on the lower mountains (up to 2000 feet), especially in Dominica.

(3) The lime grows on the same kind of soil as the orange, but prefers a lower elevation in a well-wooded sheltered valley; Montserrat and Dominica produce the best fruit, but Jamaica and Trinidad are also exporters.

3. Bananas, pine-apples, and coco-nuts all require a typical tropical climate, though the bananas can flourish at a greater height than the two others.

(1) The "sugar" and "cacao" lands of Jamaica grow the best bananas, in literally millions, and the product of Martinique, Cuba, Dominica, and Trinidad is very good.

N.B.—The banana is "the bread and potatoes of the tropics."

(2) The pines require sandy loams in which there is lime, and therefore do best in the coral formation of the Bahamas and in the limestone part of Antigua; but Jamaica and Anguilla also grow a large number.

(3) The coco-nut palms grow along the coasts, especially of Trinidad, Jamaica, and the Cayman Islands, where they are a great protection against the progress of the driven sand inland. Cf. p. 98.

4. All the spices except pimento grow best on a rich, loose soil, with plenty of vegetable refuse in it, and need great heat and moisture; and, therefore, all of them can practically be grown all over the West Indies, though some of them grow specially well in particular islands.

(1) Pimento ("allspice") grows best on a poor soil, and needs a rather dry climate; and, therefore, it flourishes most on the stony north shore of Jamaica, though it also does well in Dominica (for "bay rum").

(2) Nutmeg and cinnamon (Grenada), pepper (Jamaica and Trinidad), and vanilla (Guadeloupe) either absolutely require, or do best at, low elevations.

(3) Cardamom (Trinidad) must have height and shade; ginger (Jamaica) is indifferent to height, but must have a very rich soil.

5. Both cinchona and castor require rich and well-drained soils, which are most easily found on mountain slopes; and both are mountain plants, the cinchona requiring an elevation of from 3000 to 6000 feet if the bark is to yield any alkaloid.

(1) The cinchona, therefore, is largely confined to the mountain slopes of Jamaica and Dominica.

(2) The castor grows wild on most waste lands throughout the islands up to a height of 5000 feet, and is in some places a troublesome weed.

N.B.—Besides its medicinal properties, it yields the best and safest lamp-oil in the world.

6. The logwood comes mainly from Jamaica, Dominica, St. Lucia, Haiti, and St. Vincent, and the anatto from Jamaica and Guadeloupe.

(1) Jamaica produces also mahogany and fustic, but the best mahogany in the world comes from Haiti, and the best fustic in the world from Cuba.

7. The yams and tanias are grown all over the lowlands—for local consumption; but the cassava (specially for tapioca) can only be grown in dry heat, and the arrowroot ought to be near really good spring-water for manufacture.

(1) The cassava, therefore, naturally grows best in Dominica, Martinique, and Guadeloupe, and the arrowroot in St. Vincent and Tobago.

N.B.—The West Indies are the home of "Sea Islands" cotton (*Gossypium Barbadense*), and very fine samples are now being grown in the British possessions, especially in St. Kitts-Nevis and St. Vincent, Barbados, and Montserrat.

Lesson 39—The Greater Antilles

1. The Greater Antilles occupy seven-eighths of the total area of the West Indies; and of that seven-eighths, half is represented by Cuba, with an area six times as large as Wales.

(1) Haiti, the next in size, is very nearly four times as large as Wales.
(2) Jamaica is rather more, and Puerto Rico is rather less, than half the size of Wales.
(3) The other islands included in the group, *e.g.* Isle of Pines, Caicos, Turks, Caymans, etc., are quite small.

2. Cuba consists of a long low range of hills flanked by level plains, and terminating in the east in the high transverse range of the Sierra Mæstra.

(1) The coast is fringed with lagoons, but has several good harbours, *e.g.* Havana, Matanzas, and Santiago; and even where it is otherwise useless, there are valuable sponge fisheries, the sponges being used in damping tobacco.
(2) The mountains are covered with timber, including fustic, mahogany, and ebony; and those in the south-east also contain iron and copper.
(3) The rivers, which flow northwards and southwards from this central watershed, are too short to be useful for navigation; but they supply excellent drinking-water, and are very valuable for irrigating the plantations.
(4) Havana, which is nearly as large as West Ham, is the political and commercial capital. It has, as its name implies, a magnificent *haven*. It is the most westward harbour of the West Indies, and practically commands both the Yucatan and the Bahama entrance to the Gulf of Mexico; and it is the natural centre for the tobacco and sugar industries of the fertile western plains, over which a network of railways radiates from Havana.
(5) Matanzas, which is about as large as Worcester, shares to a less extent the advantages of Havana; Santiago,

which is about as large as Oxford, ships the iron and coffee of the Sierra Mæstra and the tobacco and sugar of the eastern plain; Puerto Principe is an important inland railway terminus, and Cienfuegos is a railway junction on a fine bay.

3. Haiti, or San Domingo, which is as large as Scotland, is divided between the negro republic of Haiti and the mulatto republic of Dominica; and the people of both are so lazy and so degraded that no advantage has been taken of either the very favourable position of the island for commerce or the extreme fertility of its soil.

(1) The island lies between the two main entrances to the Caribbean Sea, and has an important harbour on each —Port au Prince on the Windward Passage, and the fine bay of Samana on the deep Mona Passage.

(2) *Haiti* means "high hills," and the surface is very hilly. The broad Sierra del Cibao extends throughout the whole length of the island, running out in the west into two bold peninsulas; and parallel to it on the north runs the Sierra de Monte Christi, inclosing the fertile Vega plain.

(3) The forest-clad mountains of the west produce so much coffee that the Haiti republic sometimes stands next to Brazil and Java in the export of coffee. The special products of the Dominican republic are tobacco from the northern plains, especially round Santiago and La Vega, and sugar from the southern plains, especially round the town of San Domingo.

(4) The other products of the island include cacao, logwood, and the best mahogany in the world.

(5) Port au Prince, which is about as large as Reading, monopolises the trade of the western republic. The eastern, which is twice the size of the western, does most of its trade through Porto Plata, a little place about the size of Durham; but the splendid harbour of Samana has now been connected by rail with La

Vega and Santiago, and must attract the mass of the trade in future.

N.B.—San Domingo, the political capital, though no larger than Hereford or Inverness, is the oldest European town in the New World.

4. *Jamaica* means the "land of forest-rivers"; and, like Cuba and Haiti, the island has a line of forest-clad mountains running throughout its entire length, from which innumerable streams flow northward and southward across low coastal plains.

(1) On these plains immense quantities of sugar are raised, and Jamaica rum is still said to be the best in the world. The coffee of the Blue Mountains has a similarly high reputation, and there is also a very important orange and banana industry—mainly with the United States. Cf. p. 100.

(2) Amongst the other products are various spices, drugs, and dyes (cf. p. 102), and salt, phosphates of lime, guano, and turtles from the dependent islands—the salt mainly from the Turks and Caicos islands, the phosphates and the turtles mainly from the Caymans, and the guano from Morant and Pedro Cays. Cf. p. 99.

(3) Kingston, which is as large as Gloucester or Exeter, is both the political and the commercial capital. It stands immediately under the lee of the Blue Mountains, with their immense vegetable wealth; it has a fine harbour on the land-locked bay of Port Royal, and it is the terminus of the double railway system which runs through the plantations of the interior.

(4) The old capital of Spanish Town was destroyed by an earthquake, but is now an important railway junction between Kingston and the two ends of the island—Port Antonio and Montego.

(5) The other places of importance are mainly busy little ports such as Savannah-la-Mar, St. Ann's, and Falmouth. The latter, like Port Antonio, suffered for a long time from being in a Maroon district, *i.e.* a reserve held by rebellious Spanish slaves.

5. Puerto Rico, the most exposed of the group, is also the healthiest; and the healthy climate has attracted such a large population that, as in Barbados, even negroes have to work—or starve.

(1) Like the three larger islands, it consists of a range of mountains running from east to west, flanked by strips of low plain.

(2) This plain produces sugar and tobacco, especially round Ponce, with coco-nuts along the shore; the mountains produce excellent coffee, which is much the most important export; and the intermediate slopes are largely used as cattle pastures, as on the equally healthy island of Grenada.

(3) San Juan, which is no larger than Torquay or Ayr, is both the political capital and the chief port; the next largest town is Ponce. The only important inland town is San German, which is connected by rail with the rising little port of Mayaguez.

Lesson 40—The Smaller Islands

1. The smaller islands are in three groups—the Bahamas, the Lesser Antilles or Windward Islands, and the Leeward Islands.

(1) The British Government use the absurd division of the *windward* islands into "Windward" and so-called "Leeward." Cf. p. 97.

(2) From this point of view the "Leeward" Islands include from the Virgins to Martinique, and the "Windward" Islands include from St. Lucia to Trinidad.

(3) The British colony of the Leeward Islands is a federation of the five presidencies of Antigua, St. Kitts and Nevis, Dominica, Montserrat, and the Virgins; the colony of the Windward Islands consists of St. Lucia, St. Vincent, Grenada, and the Grenadines; Tobago is attached to the colony of Trinidad, and Barbados forms a separate colony by itself.

2. The Bahamas consist of several hundred islands (and thousands of reefs), with a total area as large as Yorkshire, but only twenty of them are inhabited.

(1) They are of low coral formation, thinly covered with a good sandy loam, and lie directly on the path of the Gulf Stream. Cf. p. 5.

(2) The innumerable reefs, with their warm lagoons, are the site of important sponge, turtle, and pearl fisheries, and of salt, guano, and ambergris industries.

(3) The larger islands produce very large quantities of fruit and fibre, especially pine-apples and agave. Eleuthera is the chief fruit island.

(4) Andros, the largest island, produces mainly the juniper or so-called pencil-*cedar*.

(5) Nassau, the capital, is a town of some 11,000 inhabitants (= Ryde or Kilkenny) on the island of New Providence. It is a favourite winter resort for invalids, and has a "tortoise-shell" industry in connection with the turtle fishery.

3. The Leeward Islands proper stretch along the north coast of Venezuela.

(1) The most important is Curaçao, a hilly waste on which the kind of bitter orange is grown that is used in the manufacture of the real Curaçao liqueur.

(2) The chief product of the group is salt, especially from Oruba and Buen Ayre.

(3) Willemstadt, the capital, is a town of 8000 inhabitants on the island of Curaçao. It manufactures liqueur, and is an important outpost for Dutch trade with Venezuela and Columbia.

4. The Windward Islands proper consist mainly of a series of extinct volcanoes shooting up through coral reefs, and therefore they have a peculiarly fertile soil. Most of them have a steep rocky shore with good harbours on the west, and a beach of coral sand banked up by the Trade winds on the east. Cf. p. 98.

(1) Trinidad is more than twice as large as any of the others, having an area of about 1750 square miles—*i.e.* twice the size of Lanarkshire or Warwickshire or County Londonderry.
(2) Guadeloupe is about the same size as Berkshire or County Westmeath (720 square miles); and Martinique is rather more than half the size of Guadeloupe.
(3) Dominica (290) is rather larger, and St. Lucia (270) is rather smaller, than Middlesex or East Lothian.
(4) Barbados (166) is rather larger, and Grenada (133) and St. Vincent (132) are rather smaller, than Rutlandshire or the Isle of Wight.
(5) Tobago and Antigua are about 110 square miles apiece, St. Kitts and St. Croix about 70, Montserrat and Nevis about 50, and Anguilla, St. Thomas, and Barbuda about 30.

Lesson 41—The Windward Islands

1. Trinidad, the most southerly of the West Indian islands, commands the approach to the Caribbean Sea from the south and the approach to the Orinoco from the north.

(1) The Gulf of Paria makes a splendid natural harbour, and supplies the deficiencies of the two sheltered roadsteads of San Fernando and Port of Spain, while the exposed coral beach on the east produces millions of coco-nuts.
(2) A range of high hills runs right along the north coast, and a smaller range runs up the middle of the island.
(3) The soil is very fertile, and produces sugar and tobacco —the former in enormous quantities—on the sheltered western plain, and coffee and cacao on the forest-clad hills; fruits and spices are also increasing in importance.
(4) In the extreme south-west there is the asphalt lake of La Brea, one of the curiosities of the world. It has been producing pitch ever since the days of Sir Walter Raleigh, and some 50,000 tons are still taken out of it every year.

(5) Port of Spain, which is as large as Folkestone or Macclesfield, is the political and the commercial capital, and is connected with San Fernando by a railway along the coast. San Fernando has also a short line inland to Princes Town.

2. Guadeloupe consists of two very distinct parts joined by an isthmus which is under water at high tide.

(1) The western part is volcanic, and rises to a height of 5000 feet, *i.e.* a little higher than Ben Nevis; the eastern part is a low plain of coral formation.

(2) The port of Pointe-à-Pitre, which is as large as Whitby or Montrose, stands just on the south side of this isthmus. The political capital, Basseterre, is a little roadstead in the south-west.

(3) The very fertile soil can produce all tropical products, including manioc, sweet potatoes, and bananas; but the special products are sugar, coffee, and dyes (anatto and logwood), and the remarkably damp climate encourages a large rum industry. Cf. p. 100.

3. Martinique is a mountainous island rising to the height of Ben Nevis (4400 feet), directly in the line of frequent earthquakes.

(1) The principal town is St. Pierre, but much the best harbour is Fort-de-France; and the political importance of this harbour, on the sheltered bay of Port Royal, has induced the French to provide it with dry docks and other conveniences.

(2) The stifling climate is admirably suited to sugar and rum industries; but the trade of the island has suffered terribly from the eruption of the Mont Pelée volcano in 1902.

4. Dominica and St. Lucia are two very mountainous British islands separated by the French island of Martinique. Cf. Dominica between the two French islands of Martinique and Guadeloupe.

(1) Both islands are in the shape of a narrow leaf, with a high ridge of mountains up the middle and with two bays on the west—a large one in the north-west and a small one in the south-west—Portsmouth Bay and Roseau in Dominica, and Port Castries and Soufrière in St. Lucia.

(2) Both, too, are thickly forested, and grow all the typical West Indian products; but St. Lucia exports mainly sugar and logwood, while Dominica exports mainly lime-juice and coffee. St. Lucia has a particular "crystalline" species of sugar-cane, which seems able to resist all climatic and insect plagues.

(3) Port Castries, though no larger than Cockermouth or Killarney, has the best harbour in all the Windward Islands; and, therefore, it has attracted the headquarters of the British troops away from Barbados.

5. Barbados is, however, the most important British possession in the West Indies after Jamaica and Trinidad, thanks to its position, soil, climate, and population.

(1) It is the most easterly of the islands, and thus has a specially breezy and healthy climate, though it is subject to hurricanes.

(2) The healthiness of the climate and the fertility of the soil have attracted such a dense population that, as in Puerto Rico, even negroes are obliged to work—on the plantations or in catching and salting flying-fish; and it was originally colonised largely by Scotsmen, who are always good colonists.

(3) As the whole island is flat and low, it is simply covered with sugar plantations.

(4) Bridgetown, the political and commercial capital, is a poor harbour, but a flourishing little town, as large as Stafford.

(5) As the original headquarters of the British troops in the Windward Islands, the island was well provided with railways; one of the chief stations on the main line from Bridgetown through the south-east of the island, is for Codrington College, the only university in the West Indies.

6. Grenada, St. Vincent, and Tobago—like their neighbour, Barbados—and Antigua, in the exposed north-east, have a specially healthy climate.

(1) Grenada is also so free from hurricanes that it is eminently suited for the production of spices and fruit, and it has a snug little harbour in St. George—on its leeward side. It is so healthy that it has a thriving cattle trade. Cf. Puerto Rico.

(2) St. Vincent, before the recent eruptions, exported dye-woods, sugar, and arrowroot from Kingston—on its sheltered south-west coast; it has now recovered its old prosperity. Cf. p. 104.

(3) Tobago is a forest-clad plain, which produces excellent fruit, arrowroot, and tobacco. Its chief port, Scarborough, is on the east coast, a characteristic position for a harbour that exports coco-nuts.

(4) Antigua, which is covered with sugar and cotton plantations, has a more broken coast than most of the islands, which gives it a large choice of harbours. St. John is the seat of the Governor of the so-called "Leeward Islands," but Falmouth is the best harbour.

(5) The volcanic islands of St. Kitts and Nevis export sugar and sulphur from Basseterre and Charlestown, and Basseterre also collects the salt and phosphates of Anguilla; and Montserrat exports its famous lime-juice from Plymouth. Cf. p. 104.

(6) The barren St. Thomas has such a central position and such a fine harbour that it has become a great cable and steamer centre—though, like the rest of the Virgin Islands, it is subject to hurricanes and earthquakes. It belongs to Denmark, but the British trade is so much the most important that almost no language but English is spoken on the island.

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